



YOC, BOR MTA <sha-mta-yoc@usbr.gov>

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## Operating Criteria Comment

1 message

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**Ben Walker** <bawalker@tctwest.net>

Thu, Jan 15, 2015 at 3:52 PM

To: sha-mta-yoc@usbr.gov

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From Ben Walker ([bawalker@tctwest.net](mailto:bawalker@tctwest.net)) on Thursday, January 15, 2015 at 15:52:56

message: I live in Lovell and own a boat. I am in favor of managing Big Horn Lake in a manner that will allow boat launching at Horseshoe bend by memorial day. I also love fly fishing and can understand the needs of maintaining that portion as well. I hope you will consider the needs of both the lake and the river. I am sure with our unpredictable weather, it is a hard thing to manage and both sides may feel slighted at times.

address: 16 Benchview

city: Lovell WY 82431

Submit: Send

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# Big Horn County

STATE OF WYOMING

COUNTY COMMISSIONERS  
Jerold S Ewen, Chairman  
Keith M Grant  
John G Hyde

Lori Smallwood, County Clerk  
Becky Lindsey, Treasurer  
Gina Anderson, Assessor  
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Dori Noyes, Clerk of District Court  
Kenneth Blackburn, Sheriff  
Delmar Atwood, Coroner

Office of The County Commissioners

P.O. Box 31  
Basin WY  
82410

OFFICIAL FILE COPY  
BOR - MTAO  
Phone: 307-568-2357 Fax 307-568-9375

December 16, 2014

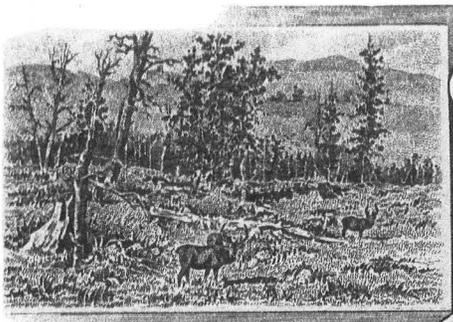
Bureau of Reclamation  
Area Manager  
Brent Esplin  
Montana Area Office  
Attn: Operating Criteria Comments  
PO BOX 30137  
Billings MT 59107

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BOR - MTAO		
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At our (cooperators) meeting on Wednesday, November 12, we were asked to provide realistic comments regarding the operation of Yellowtail Dam, past, future and present. Please consider the following as said comments on behalf of the Big Horn County, Wyoming, Board of County Commissioners.

At the July 29, 2008 meeting MTFWP introduced VARQ This concept was refined by Gordon Aycok and implemented in 2009, the Bureau of Reclamation adopted the (rule curve) to help with managing the lake at elevation levels that would minimize negative effects to both the Big Horn Lake and the Big Horn River. We applaud the exceptional work and dedication Gordon put into the development of our Rule Curve. We feel that since the adoption of the (Rule Curve), both groups have benefited. We support the Rule Curve and strongly recommend the BOR continue to follow the (Rule Curve) in the future. We also ask that the BOR include the Bighorn River Issues Group in any discussions considering operating outside the Rule Curve, although we understand BOR may need to make minor tweaks from time to time.

As we discuss Optimum Targets, Standard Targets, and Minimum Targets, we would be remiss if we didn't remind BOR and MTFWP of the Informal Agreement of 1986. In which MTFWP asked for Optimum target of 2500cfs, Standard Target of 2,000cfs, and Minimum Target of 1,500 to 1,000cfs. We remember the discussion of MTFWP's need for higher flows because of their loss of side channels. Since the study was completed showing no down cutting of the main channel, Dennis Fisher has been instrumental in getting one of the main side channels reopened, showing the only



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problem in the loss of side channels was the damming of the mouths of the side channels by the river action. It escapes all understanding, if as the gentleman at the November 12 meeting stated, it is a 52 million dollar economic fishery, why don't they reopen all their side channels and greatly improve their fishery. It seems MTFWP may need to take some responsibility and reassess their options to improve their own situation through river channel rehabilitation. In the Wyoming portion of Bighorn Lake WFG invests close to \$100,000 a year in log booms, boat ramps, and floating outhouses.

As we consider all the management complexities of the system, we need to remember that we have to consider our pure strain Sauger in the southern end of the system. It would complicate management of the system if this fish were nominated or listed!

In the presentation Clayton presented on the complexities of this past year's operation, we felt it would have given everyone a better understanding of your challenges if it had been pointed out that flood control a big factor in the decisions BOR was forced to take. We also need to remember that Flood control was the main reason for the creation of the dam.

The term "optimum" as it relates to outflows and elevation levels is a tenuous term. Optimum levels are something to shoot for, but are very seldom realized on a long term basis. We have always identified our optimum elevation level in Big Horn Lake as 3640, Our Standard Target as 3630 and our Minimum Target as 3620 feet. This level allows for launching of boats at Horseshoe Bend and also allows fishing at least to the Narrows all year. Out of the past 60 months Big Horn Lake was managed at a level below this standard level for 25 months.

As optimums are somewhat of a panacea, we strongly recommend that BOR try to get the lake to the 3620 level by Memorial Day. This is the minimum level required for launching boats at Horseshoe Bend. We understand that in some years, through the late winter and early spring months, it is hard to maintain a 3620 foot level. We feel that using the rule curve has helped achieve this objective, as only once in the past 5 years has the lake been too low to launch on Memorial Day.



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It is hard to express our appreciation to BOR for the extremely contentious task they have negotiated over the years. Anyone who hasn't lived through this process cannot understand how arduous this process has been. Big Horn County Commission has strong admiration for the dedication and hard work of the staff of the Bureau of Reclamation in accomplishing the successful outcome to this management plan. Again we encourage BOR to continue managing using the Rule Curve we all developed.

Sincerely,

Jerold S. Ewen, Chairman



YOC, BOR MTA <sha-mta-yoc@usbr.gov>

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## Yellowtail Unit Operatin Criteria Comments

1 message

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**Sue Taylor** <lovellinc@tctwest.net>

Fri, Jan 16, 2015 at 8:12 PM

To: sha-mta-yoc@usbr.gov

Good afternoon,

Please accept the attached letter for public comment on the Yellowtail Unit Operating Criteria

Thank you,

*Sue Taylor*

Grow Big Horn County

307-548-6707



**BOR Comment Letter.doc**

158K



## **Grow Big Horn County Economic Development**

On behalf of the Board of Directors for Lovell, Inc. dba Grow Big Horn County we appreciate the opportunity to comment on the operating criteria for Yellowtail, specifically water levels for Big Horn Lake. As an organization tasked with economic development for Lovell and Big Horn County, we cannot stress enough how critical lake levels are for our local economy.

This area was greatly impacted when the dam was originally built due to the loss of farming operations and the exodus of those farm families. Tourism dollars injected in to the area by sportsman and recreational boaters help to make up some of the economic loss, but we are far from seeing the full potential of that segment, and if the water levels are allowed to fall below the levels we have worked so hard to establish, we will experience further losses.

The Big Horn County Commissioners recently commissioned a county-wide strategic plan for economic development and tourism was named as a top priority for existing and new business development. Tourism is important to our future survival, and we depend on consistent and useable water levels for much of this development.

We are asking for required lake levels to meet Wyoming's recreation and fishing requirements, including a Memorial Day lake level of 3620 elevation or higher and lake levels of 3640 to 3635 through the end of November to support the national waterfowl flyway, which helps us to extend our attraction season due to the influx of sportsmen.

The National Park Service recommends 3640 between Memorial Day and Labor Day, with a minimum of 3630 and Wyoming Game and Fish requirements mirror these levels to sustain the Big Horn Lake fishery, both of which are important and viable recommendations.

In Lovell, over the past eight years, we have worked with the Bureau as well as several local, State and Federal agencies to express our concerns and needs and we have developed a good working relationship during that time, allowing for optimal water usage on both sides of the dam. We are asking to keep that positive working relationship going forward, and allow Lovell and Big Horn County visitors and residents to continue to enjoy lake recreation, fishing, and a steady flow of tourism dollars into the economy.

Sincerely,

Sue Taylor, CEO and Board members David Peck, Representative Elaine Harvey, Sarah Johnson, Valerie Beal, Tom Newman, Robert Graham, and Joseph Shumway



Comment Form

**Yellowtail Unit Operating Criteria**

**Comment by January 16, 2015**

**(Please Print Clearly)**

Name BRADEN HITZ

Organization and Address \_\_\_\_\_

Phone ( ) \_\_\_\_\_ FAX ( ) \_\_\_\_\_ E-mail \_\_\_\_\_

**Narrative Comments:**

Ice fishing, boating, swimming, camping, lifeguards,  
marina workers, local gas stations, local restaurants, & car/boat  
dealerships will all be affected by a low lake level. Tourism  
& family outings will decrease as well. I can not imagine a  
summer without the lake.

**-Attach additional sheets if necessary-**

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

Additional information can be found on the Bighorn River Issues Group website at [http://www.usbr.gov/gp/mtao/yellowtail/operating\\_criteria.html](http://www.usbr.gov/gp/mtao/yellowtail/operating_criteria.html) Please mail comments to: Bureau of Reclamation, Montana Area Office, ATTN: YT Unit Operating Criteria, P.O. Box 30137, Billings, MT 59107. Thank you.



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## Yellowtail operating plan

1 message

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Bedickson <bedickson@tctwest.net>

Thu, Jan 15, 2015 at 10:33 PM

To: "sha-mta-yoc@usbr.gov" <sha-mta-yoc@usbr.gov>

I wish to comment on the operating plan for Big Horn Lake.

There have been a lot of man hours spent developing an operating plan that meets the needs of the lake and of the river. The plan has worked well for the most part. There have been some key people that are no longer involved with the operation of the dam which has made some individuals think that the plan needs big changes. It doesn't. We had unusual weather and snowfall which made it hard to second guess Mother Nature.

When the dam was being planned we were told that there was a plan to keep the silt out of the lake. This never happened. Now the silt is taking up the room that water should occupy. They keep talking about doing another study to figure out what to do with the silt. The studies have been done but nobody wants to take responsibility for the removal or control of the silt. There is a market for the silt. Get rid of it and extend the life of the reservoir!

The lake levels can be controlled for the benefit of the lake and the river if we follow the model that has been developed.

I'm glad that Montana has been able to develop blue ribbon trout fishing on the Big Horn River. Without the dam they would still be catching big catfish. Let Wyoming get some benefit from the dam. It cost us dearly to lose the income from the farms that were condemned in order to build the dam.

Thank you for your consideration.

Sent from my iPad  
Brian Dickson  
Lovell, WY



YOC, BOR MTA <sha-mta-yoc@usbr.gov>

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## Operating Criteria Comment

1 message

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**nobody** <nobody>

Thu, Jan 15, 2015 at 4:37 PM

To: sha-mta-yoc@usbr.gov

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From Bruce Jolley () on Thursday, January 15, 2015 at 16:37:02

message: I'm a water lover and an avid boater. It has been very enjoyable the last several years having our water managed properly so that water recreation can be enjoyed on both sides of the dam. Thank You!

Please continue this in years to come so the water lovers in Wyoming can continue to enjoy our back yard.

city: Lovell, Wy 82431

Submit: Send

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**Comment Form**

**Yellowtail Unit Operating Criteria  
Comment by January 16, 2015**

**(Please Print Clearly)**

Name \_\_\_\_\_

Organization and Address \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone ( ) \_\_\_\_\_ FAX ( ) \_\_\_\_\_ E-mail \_\_\_\_\_

**Narrative Comments:**

KEEP FIGHTING  
FOR THE  
BIG HORN LAKE !!!

**-Attach additional sheets if necessary-**

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

Additional information can be found on the Bighorn River Issues Group website at [http://www.usbr.gov/gp/mtao/yellowtail/operating\\_criteria.html](http://www.usbr.gov/gp/mtao/yellowtail/operating_criteria.html) Please mail comments to: Bureau of Reclamation, Montana Area Office, ATTN: YT Unit Operating Criteria, P.O. Box 30137, Billings, MT 59107. Thank you.

December 2<sup>nd</sup> 2014

I agree with keeping the lake levels up 3640. It gets old every year when spring hits and you drive out to the lake to launch your boat and there is not enough water or no water to launch your boat. I think the state should look into building our own dame on the state line then we can regulate our water on this end and the Montana end can back up as much as they need on their end after we get our water. We have a lot of people come from Montana to use our lake and that helps the economy of our local business. So I'm 110% behind supporting the higher lake levels.



YOC, BOR MTA <sha-mta-yoc@usbr.gov>

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## Operating Criteria Comment

1 message

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David Neves <seven@tctwest.net>

Fri, Jan 16, 2015 at 9:18 AM

To: sha-mta-yoc@usbr.gov

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From David Neves ([seven@tctwest.net](mailto:seven@tctwest.net)) on Friday, January 16, 2015 at 09:18:28

message: I encourage the Bureau of Reclamation to continue to use the rule curve in managing water levels in Big Horn Lake. It has worked well the last several years. Also for elevation water levels to be at 3640 feet by July. To be at 3640 to 3635 feet until November. The level to be at a minimum of 3620 elevation by Memorial Day. Also the Bureau of Reclamation needs to continue to explore ways to mitigate the silting problem on the south end of the lake.

address: P.O. Box 7

city: Emblem WY 82422

Submit: Send

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## Operating Criteria Comment

1 message

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David Peck <dapeck00@tctwest.net>

Thu, Jan 15, 2015 at 1:50 PM

To: sha-mta-yoc@usbr.gov

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From David Peck ([dapeck00@tctwest.net](mailto:dapeck00@tctwest.net)) on Thursday, January 15, 2015 at 13:50:05

message:

To Whom It May Concern:

I have been in business in Lovell for nearly 31 years. I lived through the drought years of the early to mid-2000s and saw Main Street businesses struggle during that time.

Then came the rebirth of the recreation economy far from complete, by the way – that took place after the various agencies and governmental entities started working together to seek a balanced approach to Big Horn Lake and River water management.

This cooperative effort led by the Bureau of Reclamation, National Park Service, Big Horn County Commissioners and Friends of Bighorn Lake, among others, has worked extremely well using scientific methods to forecast runoff by assessing snowpack, precipitation, runoff and more. Nothing is perfect, but this rule curve method of forecasting and balance has been the best way I have seen over the years of balancing the interests of the lake and river fishery users.

One thing that has become crystal clear to me after years of observing the literal ups and downs of lake management is that it is far, far easier to manage this reservoir as a full lake than a drained lake. When the lake level is taken too far down, everybody loses, including the river fisheries interest north of the dam. The lake is like a bank. Storage is vital, and a proper reserve helps all interested parties. When the lake was allowed to fall too low 10 to 15 years ago, it was nothing short of a disaster for recreation and the economy of the North Big Horn Basin.

Specifically, it is imperative that the lake reach an elevation of 3,620 feet by Memorial Day and 3,640 feet by July for lake recreation, then be maintained near that full pool level throughout the summer and fall to support the national waterfowl flyway and protect the sauger.

I also implore you to address the siltation issue before it is too late. A comprehensive plan is a must. Otherwise all of this management, in time, will be for naught.

Thank you for working cooperatively for so many years in the best interests of all of the stakeholders. We in Lovell truly appreciate your efforts.

David Peck

Publisher

The Lovell Chronicle

234 E. Main Street

Lovell, WY 82431

(307) 548-2217

address: 234 E. Main

city: Lovell, WY 82431

Submit: Send

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## Fwd: Recommendations for operating criteria

1 message

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Jordan, Clayton <cjordan@usbr.gov>  
To: BOR MTA YOC <sha-mta-yoc@usbr.gov>

Tue, Jan 13, 2015 at 9:38 AM

----- Forwarded message -----

From: Doug Haacke <dhaacke@gmail.com>

Date: Mon, Jan 12, 2015 at 9:10 AM

Subject: Recommendations for operating criteria

To: besplin@usbr.gov, Tim Felchle <tfelchle@usbr.gov>, Steve Davies <sdavies@usbr.gov>, Clayton Jordan <cjordan@usbr.gov>, smicek@usbr.gov, Tom Sawatzke <tsawatzke@usbr.gov>

Cc: Gary Hammond <ghammond@mt.gov>, Ken Frazer <kfrazer@mt.gov>, Mike Ruggles <mikeruggles@mt.gov>, Bob Gibson <bgibson@mt.gov>

Folks:

Thanks in advance for the opportunity to provide comments on the operating criteria.

It is my opinion that operations under the new criteria these last five years have proven that, while it is indeed possible to operate a reservoir the size of Yellowtail with strikingly high year round elevations, it can only be done by mostly ignoring the interests of river advocates and lake recreation at the north end. When the new operating criteria were presented to stakeholders, they were presented as a living entity, along with a promise that Reclamation would strive to improve upon them in subsequent years. I ask for your help in making some adjustments.

It is my hope you will give all recommendations serious consideration, and before dismissing any suggestions out of hand, you engage with stakeholders when clarification is needed or questions arise *prior* to finalizing any new criteria.

As always, I look forward to working with you in the years ahead.

Warm regards,

-Doug



**2015 Proposed Operating Criteria Changes.docx**  
255K

U.S. Department of Reclamation  
Bureau of Reclamation  
Montana Area Office  
River and Reservoir Operations

January 2015

Attn: Brent Esplin, Steve Davies, Tim Felche, Clayton Jordan, Stephanie Micek

Re: Proposed revisions to the operating criteria for Yellowtail Dam

Years ago when I was struggling to understand the nuances of reservoir water management, friend and mentor Brian Marotz told me with a straight face that it is a scientific fact that its easier to manage the top half of a reservoir than the bottom half. I recall chuckling at what seemed to be a clever joke, but I was to discover later exactly what he was really trying to tell me.

No one will argue that its good, common sense to balance storage against evacuation, but when water management leans too far to one side or the other, stakeholders suffer. I applaud the dedication and hard work Reclamation provides year after year, but I feel strongly that engineers and water managers, working with criteria developed exclusively in-house, have set a priority on filling the reservoir *above all others*. This overly conservative approach has resulted in river releases at or below minimums for 43 of the last 60 months (which involved one dry year, one extremely wet year, and three average years). As would be expected with such an imbalance, lake elevations went to minimums only three times in the same period. This approach results in brief periods of very high releases followed by extended periods of minimal or below minimum releases and very often in wet years. With the current operating criteria, there are very, very few scenarios when river releases can be maintained above minimums, and therefore, it is time to make adjustments to those criteria.

Water year 2014 once again confirmed the overly conservative nature of the current criteria. When releases were reduced from 8,500cfs to near minimums the first week in June long before runoff completed, lake levels were just coming up through minimums. Engineers indicated they believed runoff had stopped and cut releases. From this point on, it was clear the priority was to completely fill the reservoir, although by mid-June stakeholders needs were being met and there was no urgency to refill with such haste. Nevertheless, releases were chopped to minimums. Wouldn't a more balanced approach had been to raise releases somewhat, set a slightly lower peak lake elevation and leave some storage available? Isn't that what reservoirs are supposed to do? Had the water managers not been in such a rush to fill the lake, it would have been better prepared for the wet forecast which showed runoff had not completed and, in fact, continued on again in earnest as the weather warmed. River releases jumped from minimums to 7,500cfs because *inadequate storage existed to handle the remaining runoff*. Finally, lake elevations entered the flood pool at the end of the first week in July and, except for a very brief time, stayed in the flood pool throughout July, August, September and into October. Again, wouldn't a more balanced approach have been to stop filling at 3,638ft in anticipation of the perennial increase in fall inflows and to have storage for a weather event? Instead, Reclamation chose to chase the inflows by changing releases and aggravating river

interests throughout the fall. A fall weather event that narrowly missed the Bighorn basin caused Fort Peck reservoir to rise nearly three feet. Had that weather hit the Bighorn basin, it would've come at a time when the Yellowtail was already a foot in to the flood pool.

### Imbalance

Unfortunately, the last eight years has created a rather striking imbalance in the way water is being managed in the reservoir. Nothing demonstrates this better than the following comparison:

	Average Lake Elevations			Average River Releases		
	<u>1970-2006</u>	<u>2006-2014</u>	<u>Change</u>	<u>1970-2006</u>	<u>2006-2014</u>	<u>Change</u>
Oct	3627.21	3632.70	+5.49	2843.06	<b>2478.11</b>	-364.95
Nov	3626.35	3632.62	+6.27	3036.12	<b>2350.24</b>	-685.88
Dec	3622.02	3630.28	+8.26	3027.28	<b>2363.71</b>	-663.57
Jan	3615.10	3625.79	+10.69	3001.05	<b>2329.73</b>	-671.32
Feb	3609.51	3622.16	+12.65	2981.16	<b>2295.24</b>	-685.92
Mar	3606.87	3620.94	+14.07	3065.74	<b>2473.91</b>	-591.83
Apr	3605.01	3618.09	+13.08	3063.84	3048.02	-15.82
May	3608.21	3616.96	+8.75	3061.07	3781.60	720.53
Jun	3623.09	3631.93	+8.84	4457.39	5878.78	1421.39
Jul	3631.08	3637.67	+6.59	4559.37	4471.41	-87.96
Aug	3628.23	3633.89	+5.66	2834.84	2726.29	-108.55
Sep	3626.88	3631.83	+4.95	2573.90	<b>2521.74</b>	-52.16

Of special note here is that average river releases prior to 2006 *never* dropped to minimums despite the fact these years included *nearly a decade of drought years*, but subsequent to 2006, which were mostly normal to extremely high water years, minimum flows *dominated* all but spring runoff months.

While the revised operating criteria called for a slightly fuller lake more often, no one outside Reclamation ever thought such high and persistent lake elevation increases would occur. There can be no doubt that water management over the last eight years is geared towards keeping the reservoir full with very little regard for river releases.

### Minimum Flow

We respectfully ask that Reclamation immediately and officially recognize a river release of 2,500cfs with a zero shift value as a minimum flow and stop preparing operating plans that use 2,500cfs with a zero shift value as any form of target release.

In those instances where water displacement from algae and other aquatic vegetation raises stage, releases below minimums may be used if needed to aid in refilling the reservoir. A good example was presented last August with releases fluctuating around 2,600cfs. Aquatic vegetation displaced well over a foot of water and inundated habitat that is normally only wetted when flows are 4,000cfs and higher. In this case, it is estimated that releases could have comfortably been dropped to 2,200cfs and maintained through the last half of August and all of September and October, providing an extra 400cfs to aid in refilling the reservoir (had we not already been well into the flood pool). Historical data

reveals this vegetative growth is fairly reliable (and certainly more reliable than the weather). Using shift to aid in refilling the reservoir after snowmelt has peaked, combined with the fall increase in inflows which is nearly as reliable, is just another way to provide balance to the system.

### Rule Curves

It is my opinion that rule curves developed by Reclamation are constrained by several fixed data points, namely the end of March target lake elevation (presently 3,617ft) and a fixed full pool target lake elevation (always 3,640ft+). For all intents and purposes, having a fixed starting and ending lake elevations pretty much reinforces Reclamation's desire to only have to manage the "top half of the reservoir", or in this case the top 20 feet of the reservoir most of the time. It should be noted that this approach is unique in the basin.

With lake elevations being fixed, all the risk is placed upon river releases as policy is reduced to choosing an in flow forecast and calculating how much river releases must be reached to fill the reservoir. In the following section, I will propose a sliding "full pool" lake elevation.

### End of March Target Lake Elevation

During the comment period that was taken *after* the release of the initial draft operating criteria, a number of stakeholders suggested the end of March target lake elevation was too high and would promote conditions where water was stored at the expense of the river until it was absolutely necessary to release it. *That is exactly what has happened.*

Earlier water managers felt that lower elevations were fine, and I am advocating that this elevation be dropped from elevation to 3,614ft from 3,617ft. Like the existing rule curves, this number may fluctuate slightly depending on conditions.

Bolstering this argument is that fact that Reclamation's ability to refill the reservoir when the end of March target elevation has been at or above 3,614ft has been extremely good:

Water Year	End of March Lake elevation	Peak Lake elevation	Lowest Lake elevation	Elevation gain
1971	3616	3639.35	3591.23	48.12
1974	3613	3639.86	3600.71	39.15
<b>1977</b>	<b>3614</b>	<b>3634.64</b>	<b>3613.83</b>	<b>20.81</b>
1984	3612	3640.80	3608.44	32.36
<b>1985</b>	<b>3614</b>	<b>3624.68</b>	<b>3599.59</b>	<b>25.09</b>
<b>1987</b>	<b>3613</b>	<b>3633.07</b>	<b>3609.05</b>	<b>24.02</b>
1992	3615	3641.92	3612.51	29.41
1993	3614	3643.48	3611.95	31.53
1995	3612	3646.30	3609.07	37.23
<b>2006</b>	<b>3613</b>	<b>3626.35</b>	<b>3598.43</b>	<b>27.92</b>
2008	3613	3642.50	3607.54	34.96

Only four years, listed in bold, did not fill to within a foot of full pool

Moving the end of March target lake elevation will provide for 1) some additional water to the river especially during the winter months, 2) increased power generation all year but especially during the winter months, 3) provide additional storage for runoff and 4) increase the likelihood of achieving minimum boat launch level at Horseshoe Bend for Labor Day.

The existing rule curves will need minor modifications to support this new target elevation.

### April through July Sliding Scale

To prevent the debacle of this past June as well as to smooth the hydrograph and provide additional water to the river without hampering lake elevation critical to the south end of the lake, I propose that Reclamation establish a July 4<sup>th</sup> target lake elevation that will vary depending on actual historical inflows broken into quintiles (where the 1<sup>st</sup> quintile is the highest inflow):

Quintile	July 4 <sup>th</sup> target lake elevation
1 <sup>st</sup> quintile	3,638ft
2 <sup>nd</sup> quintile	3,636ft
3 <sup>rd</sup> quintile (average)	3,634ft
4 <sup>th</sup> quintile	3,632ft
5 <sup>th</sup> quintile	3,630ft

This sliding lake elevation will be determined each month of April, May, June and July based on the current, periodic inflow forecast until August 1st is reached. In August river releases will be set, using current criteria along with surplus river release gained from stage increases due to algae and other aquatic vegetation (see next section), to manage through November 1<sup>st</sup>, at which time winter releases will be established using existing criteria (but taking into account the new end of March target lake elevation).

The target lake elevation established for July shall not be exceeded between July 1<sup>st</sup> and Nov 1<sup>st</sup> unless the following conditions exist: If existing inflow forecasts suggest an increase in river releases would be required to not exceed the July target lake elevation, and river releases are at or above minimums, those additional releases may be diverted to storage while maintaining existing releases.

Note: The lake elevations I have listed in the table above are certainly open for discussion. I've not had the time to model these numbers to arrive at exact figures. Quite recently, it came to my attention that a sliding scale such as this has been modeled in some detail before between Reclamation and FWP, and I hope that those discussions could be reconstituted. ***Those models demonstrated that even with end of March lake elevations well below 3,610ft and in average to dry water years, the reservoir could be filled, river releases could be maintained at or above minimums, lake elevations reached or exceeded 3,617ft on Memorial Day and power generation was maximized.***

## **August, September and October**

The months of August, September and October historically represent the months of highest aquatic vegetation density and displacement. To an angler on the river, 2,000cfs often looks and fishes like 4,500cfs during these months.

I suggest Reclamation look at ways to manage the river by stage during these months, and bank what could be a *significant* amount of water during these months.

## **Winter releases**

Winter releases will be set using the current criteria but using the new end of March target lake elevation of 3,614ft. It is important to note that I fully realize that during dry years river releases reaching down to 1,500cfs may be required, and I have been assured by FWP biologists this risk is fair outweighed by the benefit of better and more timely flows during other times of the year.

**Should flows below minimums be required, Reclamation will have the full support of anglers, guides, outfitters and river advocates, but *never, ever* again when the current objective is solely to fill the lake to 3,640ft.**

## **Gains**

However gains have been calculated over the last six years using Gordon Aycock's method, the actual inflows have been consistently higher than forecast, suggesting the methodology of calculating gains needs tweaking. The beginning of the current water year is a good example, where the operating plan using the most probable inflow forecast calls for an end of December lake elevation of 3,629.92ft and the actual elevation was 3,632.03ft.

In these situations of higher than expected storage, one must question why that water isn't being used. Is that not the purpose of a reservoir? It is inevitable that the water will eventually be sent down the river, but why not when all of it can be used efficiently instead in hurried, massive doses when additional storage is needed and at the expense of the fishery and power generation? FWP has indicated these small increases would be beneficial as long as flows stayed at or above the releases set in the operating plan.

## **Balance**

I believe these recommendations will also benefit lake users. On one hand, setting strict upper limits for a July 4<sup>th</sup> target lake elevation should prevent the train wrecks from earlier years where inadequate storage caused campgrounds to be inundated under 10 or more feet of water, and wreaked havoc with floating debris. On the other hand, the lower March target elevation is more consistent with historical targets and creates additional storage while still making Memorial day lake elevations realistic.

Without doubt, more water will travel down the river, and WAPA has already indicated they would prefer a less conservative approach to water management.

Having consulted with a number of experienced and talented engineers and biologists, I believe these recommendations will help achieve a more balanced approach and make possible the ability to achieve and maintain river releases above minimums without adversely affecting lake recreation.

In closing, thank you for your consideration. I very much hope we can sit down and discuss some or all of these recommendations at your earliest convenience.

Warm regards,

A handwritten signature in black ink, appearing to read "Doug". The signature is stylized with a large, sweeping initial 'D' and a cursive 'oug'.

Doug Haacke

Montana Trout Unlimited, Immediate Past Chairman  
Magic City Fly Fishers, TU Chapter 582, Conservation Director  
Bighorn River Alliance, Advisory Board  
Fly fishing guide, #15056  
Angler



Comment Form

**Yellowtail Unit Operating Criteria**  
**Comment by January 16, 2015**

(Please Print Clearly)

Name DOUG HARRISON

Organization and Address 1316 Rd 11 1/2 Lowell WY

Phone (307) 272 8559 FAX ( ) \_\_\_\_\_ E-mail \_\_\_\_\_

**Narrative Comments:**

I Believe the current plan should stay in effect so both ends of the IATC Benefit that just the Admin end

**-Attach additional sheets if necessary-**

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

Additional information can be found on the Bighorn River Issues Group website at [http://www.usbr.gov/gp/mtao/yellowtail/operating\\_criteria.html](http://www.usbr.gov/gp/mtao/yellowtail/operating_criteria.html) Please mail comments to: Bureau of Reclamation, Montana Area Office, ATTN: YT Unit Operating Criteria, P.O. Box 30137, Billings, MT 59107. Thank you.



YOC, BOR MTA <sha-mta-yoc@usbr.gov>

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## Operating Criteria Comment

1 message

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Edward A. Allred <ehome@tctwest.net>

Thu, Jan 15, 2015 at 4:32 PM

To: sha-mta-yoc@usbr.gov

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From Edward A. Allred ([ehome@tctwest.net](mailto:ehome@tctwest.net)) on Thursday, January 15, 2015 at 16:32:23

message: I would like to see the lake level raised to an elevation of 3640 by July of each year and maintained at least to an elevation of 3635 through November. The winter lake level should be maintained at a level of 3620. These levels would support recreation which would support the local economy. Without adequate levels of water in the lake our local economy suffers. In addition I believe there is a sediment issue in the south end of the lake. The reduction in water storage caused by the increased sediment adversely affects all users of the lake, including the wildlife.

address: 243 E 7th St

city: Lovell WY 82431

Submit: Send

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## Operating Criteria Comment

1 message

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Representative Elaine D Harvey <elaine.harvey@wyoleg.gov>  
To: sha-mta-yoc@usbr.gov

Thu, Jan 8, 2015 at 9:40 AM

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From Representative Elaine D Harvey ([elaine.harvey@wyoleg.gov](mailto:elaine.harvey@wyoleg.gov)) on Thursday, January 08, 2015 at 09:40:30

message: First, I would really like to thank the Bureau for all the work done in the last 8 years. They have listened and been responsive to all the parties that came to the table. During that time we experienced wide swings of hydrology and they responded quickly and appropriately.

Some of the good things that have come together are:

The responsiveness of the BoR. Lenny Duberstein was a great facilitator and invited all to participate. Gordon Aycock developed and refined the Rule Curve that responded to the changing conditions.

Agencies came to the table and cooperated: MT Fish, Game & Wildlife; WY Game & Fish; NPS; Army Corps of Engineers; Western Power Authority; Big Horn Counties from MT and WY; and the Wyoming Legislature.

Friends of the Big Horn Lake; Friends of the Big Horn River; business and landowners;

Representatives from Congressional offices from both states.

I appreciated that they looked at the water levels/ flows that every group needed to succeed in their interests. They have made efforts to accommodate all groups.

I would like to see the Bureau continue under the same operating criteria and continue to refine the Rule Curve. It allows for:

Lake levels of 3620 from Memorial Day, 3640 by July, and levels of 3640 3635 through the end of November. That allows for flat water recreation all summer and enough water to accommodate the birds that fly the National Water Fowl Flyway. It sustains the lake fishery that protects the pure strain sensitive Sauger fish.

It follows the recommendation of NPS who is charged with establishing optimum and minimum lake levels.

As you are aware, the legislative boundary of the Yellowtail project and Bighorn Canyon NRA do not include the Big Horn River below the Afterbay Dam. That being said, the Bureau has been sensitive to the Blue Ribbon Fishery below the dam. I feel that the best protection for that industry is to have water in the bank of the lake.

Operating the dam following the rule curve is the closest criteria that allow the North Big Horn County, WY to regain economic viability through tourism that was envisioned when the project was originally planned. We may someday have the visitors that will bring tourism dollars to replace the farming economy that it destroyed. Even when we stabilize the water controls, there are other items I would like to see added to the plans.

We would like the Bureau work with the U.S. Army Corps of Engineers to raise the tip of the joint use space from 3640 to 3645. That allows for the storage that we have lost through silt deposited in the lake through the years. It allows for more leeway during the run-off season to maintain lake levels and control flooding downstream.

I would like to see a comprehensive silt control plan that addresses the accumulated silt. The silt deposit reduces the storage capacity in the lake and reduces recreation at the south end of the lake where flat water recreation is possible.

Thank you again for all the efforts you have made in the last 8 years.

Representative Elaine D Harvey  
Wyoming State Legislature  
(307) 548-7866  
792 Garfield Ave  
Lovell, WY 82431

address: 792 Garfield Ave

city: Lovell, WY 82431

Submit: Send

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YOC, BOR MTA <sha-mta-yoc@usbr.gov>

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## Operating Criteria Comment

1 message

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**Gary Emmett** <gary.c.emmett@gmail.com>  
To: sha-mta-yoc@usbr.gov

Thu, Jan 15, 2015 at 7:16 PM

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From Gary Emmett ([gary.c.emmett@gmail.com](mailto:gary.c.emmett@gmail.com)) on Thursday, January 15, 2015 at 19:16:42

message: Lovell needs the Big Horn Lake to be full. Economic stability in the region depends on it. It would be best to have water levels to be at or near these levels: Winter minimum: 3620 feet  
Memorial Day level: 3630  
July to November level: 3640 .

Also there is concern of the silt coming into the Yellowtail habitat area from to large water tributaries.

Water levels that are kept at the above rates help with all aspects of wildlife.

Please Keep The Water in the Big Horn Lake.

address: 887 Shoshone Ave

city: Lovell, WY 82431

Submit: Send

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## Operating Criteria Comment

1 message

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Heather Sawaya <hestemessy@gmail.com>

Thu, Jan 15, 2015 at 2:14 PM

To: sha-mta-yoc@usbr.gov

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From Heather Sawaya ([hestemessy@gmail.com](mailto:hestemessy@gmail.com)) on Thursday, January 15, 2015 at 14:14:00

message: Regarding water levels in Big Horn Lake- It is important that the lake levels be maintained at 3,640 feet from July to November, with a winter minimum of 3,620. Additionally, a level of 3,630 feet by Memorial Day enables the most recreational use for the lake. These numbers are supported by the WY Game and Fish, and the Natl Park Service. Boating, fishing, hunting and similar activities offset the loss of productive farm and ranch land this area experienced when 70 families were displaced by the building of the Yellowtail dam. Additionally, the Bureau of Reclamation needs to address the sedimentation issue on the south end of the lake. I appreciate Big Horn Lake water management of the last 5 years, or so. Let's do what we can to not revert to an empty lake- which is of no benefit to anyone.

address: 629 MONTANA AVE

city: LOVELL

Submit: Send

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Comment Form

Yellowtail Unit Operating Criteria  
Comment by January 16, 2015

(Please Print Clearly)

Name JAMES SZLEMKO

Organization and Address 138 CARMON AVE  
LOVELL WY 82431

Phone (866) 227-1011 FAX ( ) \_\_\_\_\_ E-mail \_\_\_\_\_

Narrative Comments:

ALTHOUGH THE YELLOWTAIL DAM IS LOCATED IN THE STATE OF MONTANA THE RESIDENTS OF WYOMING HAVE EQUAL RIGHTS IN DETERMINING THE WATER OUTFLOW FROM THE DAM AND WATER LEVELS OF THE LAKE AS NEARLY EVERY DROP THAT FILLS THE YELLOWTAIL RESERVOIR ORIGINATES IN THE STATE OF WYOMING AND THE FEDERAL GOVERNMENT SHOULD NOT MAKE DECISIONS BASED ON THE SIZE OF STATE ECONOMIES OF DIFFERENT STATES AS THE DECLARATION OF INDEPENDENCE STATES THAT ALL MEN ARE ~~ARE~~ CREATED EQUAL AND WITH THAT GOES EQUAL RIGHTS. THE LOCAL LOVELL ECONOMY MAY NOT BE AS LARGE AS THE STATED 52 MILLION DOLLAR MONTANA FISHING INDUSTRY, BUT THE WATER HIGH ENOUGH TO LAUNCH BOATS IN EARLY SPRING BRINGS IN EXTRA FUNDS TO OUR ECONOMY AND IT IS JUST AS IMPORTANT TO US AS IS MONTANA'S FISHING ECONOMY

-Attach additional sheets if necessary-

*James Szlemko*

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

Additional information can be found on the Bighorn River Issues Group website at [http://www.usbr.gov/gp/mtnao/yellowtail/operating\\_criteria.html](http://www.usbr.gov/gp/mtnao/yellowtail/operating_criteria.html) Please mail comments to: Bureau of Reclamation, Montana Area Office, ATTN: YT Unit Operating Criteria, P.O. Box 30137, Billings, MT 59107. Thank you.



YOC, BOR MTA <sha-mta-yoc@usbr.gov>

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## Operating Criteria Comment

1 message

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Janet Koritnik <koritnik@tctwest.net>

Mon, Jan 12, 2015 at 9:49 AM

To: sha-mta-yoc@usbr.gov

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From Janet Koritnik ([koritnik@tctwest.net](mailto:koritnik@tctwest.net)) on Monday, January 12, 2015 at 09:49:40

message: As Lovell, WY residents we very much want the continuation of Big Horn Canyon National Recreation Area including the Lake. It is a wonderful place for both locals and visitors to our area. The sediment issue must be dealt with so that the Lake continues to be available for recreations, fishing, stream flows, power generation, and flood control.

The past summer, 2014, it was nearly July before we could dock our boat in Horsebend because of driftwood and low water levels.

We support Lake levels of 3620 by Memorial Day and 3640 by July; in addition to 3640 to 3635 by the end of November to support the national water fowl flyway. The absolute minimum lake level of 3617 is required.

Our community benefits greatly from an economical standpoint for the Lake; but also the recreation is a great value. My family spends several days a year on the Lake; many evenings have been enjoyed on the water and we do not want to lose that opportunity. We want the Lake to still be usable for our children and grandchildren; but this silt issue could prevent that. People also enjoy the beach area when water is present.

Thank you for your time.

address: 100 Wyoming St

city: Lovell, WY 82431

Submit: Send

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CERTIFIED RECEIPT #: 7011 0470 0001 5597 0470

December 10<sup>th</sup>, 2014

**MY COMMENTS (2015 Bighorn Canyon NRA lake Management):**

~~These~~<sup>are</sup> my official Comments concerning the management of the Bighorn Lake (2015 upwards); and can't be construed as any other thing. This is not a form letter, either.

I became aware of these issues, concerning the management of the Lake, while talking to Steve Kyle. He mentioned that the last few years the Bureau of Reclamation has been utilizing THE RULE CURVE (Guidelines for water utilization for the Bighorn Lake). It was my understanding that he supported this endeavor. He also expressed the fact that he liked the water levels in the lake these past few years: Versus the low water levels kept in the lake in previous times. (Basically, due to political pressure, the Northern end of the lake had their quotas met and the Southern end of the lake just did without.)

Recently, while in a meeting concerning these issues (in Billings) it came to Steve's attention that possibly some of the special interests at the Northern end of the lake were reapplying pressure to increase water level usage at their end of the lake. Thereby draining this end of the lake (Southern), at our expense.

This is unacceptable to me.

[NOTE: I am aware that all parties – STAKEHOLDERS – accepted and supported THE RULE CURVE. Therefore, you need to continue to utilize it in your decision-making process.]

**HISTORICAL:**

The residents at this Southern end of the lake made huge concessions in order to create the lake. In turn "the Government" made promises to residents at this end that "such-'n-such" conditions would be met and maintained to repay us for all of our concessions.

For example: The town of KANE was completely eradicated and when the water levels are at the proper level (at this end of the lake); what was once KANE is now underwater. All those people's lives were turned upside down (and quite a controversy at the time, as they weren't too happy about it as I recall.) Including the fact that something like 30,000 productive acres were taken out of cultivation.

My family personally had land appropriated for this endeavor (i.e.: lake) through the Right of Emanate Domain. [Horseshoe Bend Area] That was an interesting adjustment, let me tell you. Other large sections of our land are contained within the boundaries of the Bighorn Canyon National Recreation Area.

Etc.

Therefore it is of great interest to me, if and when, the promises that were made (back in the 1960's) to the residents of this end of the lake are not maintained. I am one of those residents and your NEXT DOOR NEIGHBOR. I am what is called a STAKEHOLDER (and a land owner). These issues are of interest to me.

**CURRENT:**

Included, as an Attachment (Attachment #1), is a list of water levels required for this end of the lake. I SUPPORT ALL OF THEM. I'm including this Attachment, to give you some guidelines concerning my expectations. (As a STAKEHOLDER and next door neighbor.)

Something that I think may be of interest to you; my bias (we all have one). I'm an Environmental, Constitutional and Civil Rights Activist. That said, I'd like to point out several things that I think are pertinent to this conversation.

- (1) **WATER FOWL FLYWAY:** The water levels are important as wildlife habitat. This ISSUE is important to more species than just humanity. Wetlands support a great diversity of species; both animal and plant life. This is a very important concern in the decision-making process. Ecological Diversity is important in the larger scheme of things.

The Yellowtail Wildlife Management Habitat along the Shoshone River (which empties into the lake) is very ecologically important. The water fowl flyway, and the wetlands that the lake and appropriate water levels maintain, is also a very important consideration!

The Migratory Bird Act is (International) Law. [NOTE: I'm currently in the Federal District Court, as well as the Ninth Circuit Court of Appeals, arguing the importance of this Act: Which the BLM is currently disregarding. This is extreme self-interest on the part of the BLM; and the LACK OF ACCOUNTABILITY ISSUE is involved here as well.]

- (2) **SAUGER (Sensitive Species):** I've been through this environmental process myself. This was approximately 2005- 2008 or thereabouts. Please see Attachment #2 for confirmation. It was when the Montana Fish, Wildlife and Parks were in the process of protecting the native pure-strain cutthroat trout that inhabits Crooked Creek (which runs through my property). I supported this endeavor. As an Environmentalist I would support protecting the Sauger. (The Endangered Species List and all that.) This is no small consideration, and is very important in the consideration process.

As it states in Attachment #1: *"The National Park Service recommends 3640 between Memorial day and Labor day, with a minimum of 3630."* This is an important point that the NPS is making here. Especially in this arid part of the world. We all know and recognize that water is KING; and our wetlands are exceedingly environmentally important. (THE RULE CURVE.)

Therefore: Please continue to follow THE RULE CURVE when making water level decisions in Bighorn Lake. Please don't "short" the residents at this end of the lake (and all species) just because you can, and it's politically expedient.

Thank you for your time and attention given to these ISSUES.

**THE FREEDOM OF INFORMATION ACT:**

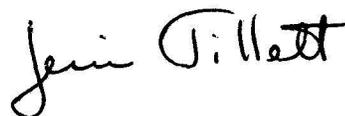
Per the Freedom of Information Act (FOIA) please send me the following formation:

- (1) **A COPY OF ALL COMMENTS SENT TO YOU.** This would include all form letters (with separate signatures), scrapes of paper with comments, e-mails, longer individual comments (like mine is), etc. ALL COMMENTS.
- (2) **RESULTS & CONCLUSIONS:** I expect you-all to analyze all the comments and arrive at a conclusion, which you will document. I want a copy of those conclusions and that document.
- (3) **ENVIRONMENTAL ASSESSMENT (EA):** If you are writing an EA (or something similar) and it is independent of the conclusions; please send that as well. [NOTE: If the conclusions are imbedded in the EA, the EA is sufficient.]

Please send the FOIA to the following address: Jerri Tillett  
Box 331  
Lovell, WY 82431  
(406) 484-2673

Thank you for your attention.

Sincerely Yours;



These are some ideas on how to comment on the 2015 management of Bighorn Canyon NRA lake management.

We would again like to ask the U.S. Army Corps of Engineers (Corps) raise the top of the joint use space from 3640 feet to 3645 feet. This would reduce the exclusive flood pool allocation by five feet.

Bighorn Lake Sediment is an issue that must be fixed by BOR and NPS as operators of the reservoir. We envision multiple partners would join this project. As the silt builds the water storage in the reservoir shrinks, this impacts everyone, lake recreation, fishing, stream flows, power generation, flood control!

Required Lake levels to meet Wyoming's recreation and fishing requirements

Memorial day lake level needs to be at 3620 elevation or higher

lake levels for summer recreation need to reach 3640 by July

lake levels of 3640 to 3635 through the end of November to support the national water fowl flyway

Wyoming Game and fish requirement mirror these lake levels to sustain the lake fishery, especially the pure strain sensitive species Sauger.

The National Park service recommends 3640 between Memorial day and Labor day, with a minimum of 3630. For non-summer season NPS recommends a minimum lake level of 3620.

The economy of the local business benefit from these lake levels without water in Wyoming the Lovell area suffers

The NPS and BOR have an MOU, which states "The service shall determine optimum and minimum pool levels desirable for public recreational use and provide the Bureau with this information for consideration in carrying out the purposes of this chapter.

#### **SUBCHAPTER LXXVIII—BIGHORN CANYON NATIONAL RECREATION AREA**

#### **§460t. Establishment**

##### **(a) In general; description of area**

In order to provide for public outdoor recreation use and enjoyment of the proposed Yellowtail Reservoir and lands adjacent thereto in the States of Wyoming and Montana by

the people of the United States and for preservation of the scenic, scientific, and historic features contributing to public enjoyment of such lands and waters, there is hereby established the Bighorn Canyon National Recreation Area

An absolute minimum lake level of 3617 is required

This is a link to the comments page

[http://www.usbr.gov/gp/mtao/yellowtail/operating\\_criteria.html](http://www.usbr.gov/gp/mtao/yellowtail/operating_criteria.html)

The legislative Boundary of the Yellowtail project and the Bighorn Canyon NRA do not include the Bighorn River below the Afterbay Dam.

*I support this - it is acceptable -  
and the Rule Curve.*

*Jim Tillet*

*12/10/14*

—  
this page) Added 2014: [IBLA: 2014-158]

Attachment #2

✓  
**Brown Trout Removal from Above  
Permanent Fish Barrier in Crooked  
Creek**

Not the actual EA!!

↳  
**Draft Environmental Assessment**



Fall 2007  
Montana Fish, Wildlife and Parks  
Region 5, Billings

revised  
11/10/07  
(Postmarked)  
2/c

2014 [BIA: 2009-302]  
Part of Attach: (C)  
JT

**ROTENONE TIMELINE:**

November 13<sup>th</sup>, 2007

**PREVIOUS HISTORY**

**APRIL 2005:**

In April Darin Watschke & Co. spent the afternoon with me explaining the proposed "SAVE THE CUTHROAT TROUT PROJECT" and exploring options. During the afternoon, while they were electrofishing on my property, they explored the "POISON OPTION" (i.e.: ROTENONE) and asked what my stance on that option was. I was less than enthusiastic and my reply was "No.". The subject was then shifted, and other topics of conversation were perused. I was never consulted about this topic again (by anyone).

**APRIL 2006:**

The BLM introduced their Environmental Assessment ~~MT-010-06-27 (CROOKED CREEK FISH BARRIER)~~ to the public for Comments (in which I participated). In that EA (page 11) the following is stated:

"Poisons: Alternatives relying on use of piscicides (i.e.: chemical poisoning of non-native brook, brown and rainbow trout) were considered as having potential to meet the purpose and need but are not being analyzed in detail at this time based on technical feasibility (effective poisoning would require draining of several beaver ponds on private land in the lower reaches of Crooked Creek)."

Enclosed within my Comments to that EA was the following: "I would also like to take this time to thank all concerned for rejecting the proposed "Poison Alternative" (page 11) as I would definitely be a problem there (and I think Darin "heard" that)."

**NOVEMBER 2007**

The Montana Fish, Wildlife and Parks wrote and released a DRAFT ENVIRONMENTAL ASSESSMENT (BROWN TROUT REMOVAL FROM ABOVE PERMANENT FISH BARRIER IN CROOKED CREEK)...Fall 2007.

**NOV. 8<sup>TH</sup>, 2007 (THURSDAY):** The date of the envelope in which the EA was enclosed.

**NOV. 10<sup>TH</sup>, 2007 (SATURDAY):** While in route to work (very late PM), I picked up my mail and the EA was in my mailbox.



## Comment Form

### Yellowtail Unit Operating Criteria

Comment by January 16, 2015

(Please Print Clearly)

Name Jesey La Fleiche

Organization and Address Friends of Big Horn Lake  
223 Hwy 32  
Lovell, WY 82431

Phone (307) 754-4455 FAX ( ) \_\_\_\_\_ E-mail twolite@outlook.com

#### Narrative Comments:

Your water operation methods the past few years have been good considering the challenges of mother nature has given you. I know that keeping all parties involved in your management scheme happy is difficult, but overall, it has been done for the betterment of all concerned.

I would like to see the level of the lake for operating criteria increased to the elevation of 3645 feet. Also, a lake level of no lower than 3617 feet would be acceptable. Even more appreciated would be a minimal level for the lake to be no less than 3600. Snow pack and Rainfall permitting, these levels would alleviate a lot of the problems. *Jesey La Fleiche*

-Attach additional sheets if necessary-

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

Additional information can be found on the Bighorn River Issues Group website at [http://www.usbr.gov/gp/mtao/yellowtail/operating\\_criteria.html](http://www.usbr.gov/gp/mtao/yellowtail/operating_criteria.html) Please mail comments to: Bureau of Reclamation, Montana Area Office, ATTN: YT Unit Operating Criteria, P.O. Box 30137, Billings, MT 59107. Thank you.



Comment Form

Yellowtail Unit Operating Criteria

Comment by January 16, 2015

(Please Print Clearly)

Name Jim Minchow

Organization and Address Minchow's Service, LLC + Minchow's Food Court  
(Sinclair + Blimpie) 317 E. Main  
Lovell Wy 82431  
307-548-7211

Phone (✓) 307-548-7211 FAX (✓) 307-548-7331 E-mail minchows@tctwest.net

Narrative Comments:

For the last 4 to 5 years you have managed the lake levels  
way better where both the south end has maintained water and  
the north end fisheries have had enough water. I think  
staying on this course is a win win situation, so would hope  
you stay on the same track. The tourist industry is vital to  
us here and has helped with our economy greatly. We did not  
have that before, so thank you.

Jim Minchow

-Attach additional sheets if necessary-

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

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YOC, BOR MTA <sha-mta-yoc@usbr.gov>

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## Operating Criteria Comment

1 message

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**Joe anderson** <hsbmotel@tctwest.net>

Fri, Jan 16, 2015 at 10:25 AM

To: sha-mta-yoc@usbr.gov

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From joe anderson ([hsbmotel@tctwest.net](mailto:hsbmotel@tctwest.net)) on Friday, January 16, 2015 at 10:25:00

message: use thr current rule curve that is in place get lakelevel to 3640 as soon as possible to enhance fisshing in the reservior and water fowl hunting and maintain water levels for winter ice fishing

address: 375 east main st

city: lovell wyo 82431

Submit: Send

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## Operating Criteria Comment

1 message

Joseph Shumway <shumway79@gmail.com>

Tue, Dec 16, 2014 at 9:02 AM

To: sha-mta-yoc@usbr.gov

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From Joseph Shumway ([shumway79@gmail.com](mailto:shumway79@gmail.com)) on Tuesday, December 16, 2014 at 09:02:36

message: My Name is Joseph Shumway. I am an interested citizen and am writing this letter to voice my support for the Big Horn Lake and Recreation Area and its current management. My understanding is that discussion is taking place to determine the proper water levels of the lake. I am by no means an expert in this area, however, I am a resident of Lovell, Wyoming and I believe that the Bighorn Canyon Recreation Area is an important contributor to the local economy and a substantial driver of tourism activity for my town. I would like to see the available use of the lake maximized. In order for that to happen, the water levels must be maintained. Based on information from experts in this area, the lake levels need to be at an elevation of 3,620 ft. or higher in order for the lake to be used for fishing and other recreation. I support an initiative to bring lake levels to this minimum elevation of 3,620 ft by Memorial Day each year. Experts have recommended a minimum level of 3,640 by July and levels of 3,640 - 3,635 through the end of November and I am in support of managing the lake to support these water levels.

Another concern for the Bighorn Lake is the level of sediment that is deposited each year as water is deposited from the rivers that feed the lake. At a recent Chamber of Commerce Luncheon, the issue of sediment deposit was presented and an estimate was given that the lake accumulates approximately 1 foot of sediment per year. With a base of 25 feet, and at this rate, the lake would become filled with sediment within 30 years and become unusable in the ways it is currently used. I encourage a plan to remediate this issue to preserve the lake. From what I have learned, I believe the current management team has done a great job with management of the water levels given the variables they can control and I would encourage them to continue their efforts. Thank you for your consideration.

address: 852 Garfield Ave.

city: Lovell, WY 82431

Submit: Send

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## **Fw: Bighorn Canyon National Recreation area (PARK)**

1 message

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**Keith Grant** <rimrock@tctwest.net>

Mon, Jan 12, 2015 at 3:07 PM

Reply-To: Keith Grant <rimrock@tctwest.net>

To: sha-mta-yoc@usbr.gov, Brent Esplin <besplin@usbr.gov>

Bureau of Reclamation  
Montana Area Office  
ATT: Operating Criteria Comment  
Billings Montana 59107

Brent,

In the early 2000's Wyoming was told that the lake in Wyoming was dry because of Irrigation demands below the Dam. Since we are well aware of Irrigation needs in our local communities, we accepted that explanation. In the fall of 2005 we experienced a big water event, and it filled the lake in Wyoming. As you can image we were all excited to see our lake in Wyoming full! The spring of 2006 the BOR drained the lake in Wyoming in order to accommodate their informal agreement with MFWP's requests for river flows! This sparked some outrage from the Wyoming Officials and residents, so we started researching Management Plans for Bighorn Canyon National Recreation Area, or **NATIONAL PARK!!!** We discovered that the Definite Report Plan that created Yellowtail Dam allowed a minimum river flows of 1000 cfs, and we requested BOR cut flows to 1000 cfs. We held meetings in Lovell and invited BOR, and MFWP's, and the public. We developed a power point presentation describing Wyoming, and Big Horn County's losses, and they are significant! 73 Farm Families were displaced by the Dam, and 30,870 acres disappeared from the tax rolls! Wyoming and the local communities were promised a tourism economy that would replace the farming economy we lost, when the park was fully developed, that has still not happened!! We were sold a NPS Master Plan that would develop our National Park, and it hasn't happened 48 years later!

In the beginning we were stonewalled by the BOR and the NPS, so we hired a consultant, and with the help of the Governor's office we made a trip to Washington DC. We met with BOR Commissioner Johnson, NPS Superintendent Mary Bomar, the head of CEQ, and several Senators and their staff. That trip with the knowledge learned, helped the BOR and NPS decide to negotiate and start working on returning to their legal required management plan.

We discovered that through a MOU agreement between BOR and NPS, that the NPS was to recommend their lake level requirements for Lake recreation in Wyoming and Montana, not just in Montana, and the BOR would do their best to accommodate NPS request! NPS then requested a minimum level of 3620 for non recreation season and minimum level of 3630 from Memorial day to Labor day, and a preferred level of 3640. We found that the BOR had a informal agreement with MFWP's of Optimum flow of 2500 cfs, standard flow of 2000, and a minimum flow of 1500 cfs, and in rare instances of water emergency a flow of 1000 is justified! As we held our meetings MFWP's asked for a Optimum flow of 3500 cfs, due to the opinion that the river bed had down cut leaving the side channels dry! Through the studies that the Bighorn River Issues Group has done, it was discovered that no down

cutting has occurred on the river bed, it was discovered that the river action has dammed the mouths of the side channels. This was proven by Dennis Fisher ( Fort Smith outfitter ) when he cleared one of the best side channels, it now flows as good as ever. With some serious effort by MFWP's could restore Montana's Bighorn River side channels. I came across an article by a Montana Fishery Outfitter, it is quite interesting as it points out a problem that came up at our last Bighorn River System Issues Group meeting. MFWP's were asked what their objectives for the fishery on the Bighorn River was, they stated that they didn't have objectives for the Bighorn River!!!! Over the years we have been told by Montana Folks that the Bighorn River Fishery is a 30 million dollar a year business, this year Rick Gehweiler informed the Issues Group it has jumped to a 51 million dollar business this year, must have been a great year!! NPS has a study out this year showing that Bighorn Canyon National Park created \$9,821,000 economic benefit! It seems there is a huge discrepancy, NPS currently manages the Bighorn River in the expanded boundary? This raises a question, why is NPS managing the river when it is in the expanded boundary that the Secretary has agreed with the tribe not to manage, and that it is prohibited to manage without the tribes agreement! The Trans -Park road cannot be finished because part of it goes through the expanded boundary, and the Secretary has agreed not to manage or develop the National Park with out the tribes agreement, and the tribe won't agree that the expanded boundary is legal. This is troubling to me that NPS will manage the expanded boundary for Montana, but not for Wyoming? It is interesting to consider that the MOU that created the expanded boundary was for 50 years! It is due to expire in 2017, I wonder what plan NPS, or MFWP's has for going forward after 2017???

Bighorn Canyon National Recreation Area ( **National Park** as elevated to by the Redwood Act) Was set apart by President Johnson for the Mechanic and his five children for a playground! MFWP's introduced VARQ model, which BOR Gordon Aycock , and Clayton Jordon, developed into the Rule Curve. The Bighorn River Issues Group reviewed and approved it, it was our plan, and Doug Haacke worked the bugs out of it!!! This year didn't work out great for River Outfitters so they think it needs changed, it didn't work well for the lake in Wyoming either! In one of our first meetings MFWP's Ken Frazier stated 2004 ( bad drought year) was a great fish year? It seem that MFWP's may be neglecting their fishery duties by not developing objectives for their Bighorn River fishery, in an interesting article from Fishing Montana by Michael Sample he tells about a drought in 1986 and 1987, that as Michael explains "it took a drought to rescue the Brown Trout from their own kind." The recruitment rate had become so strong that the mortality rate for bigger fish reached 99%. He states "A riverine ecosystem will only produce so many pounds of trout food,!" Could the septic systems at Fort Smith be adding to the river ecosystem trout food, and the moss problem? Could there be a fishery management problem, that may be contributing to some of the river fishery problems?

I requested a map of the Yellowtail Unit's legislative boundary, it seems that NPS is managing the expanded boundary on the river, against their legal authority! The river also seems to be outside the BOR legislative boundary!

BOR has a great web site of the Bighorn River System issues group, it has the history of the issues group, for anyone interested. I do not think we need to start over with the fighting, and name calling! We have come too far!

I would like to restate my comments from January 25, 2011,

**"I would like to thank Dan Jewell and his staff for the great work they have accomplished over the past three and a half years, the Bighorn River System Long Term Issues Group, is Folks made up of government and local citizens working for a balance to best meet the needs of all stakeholder's. It has been a long and sometimes**

**contentious process, but it has been well worth it. I believe that if there is a genuine commitment to these operation plans, and if politics allow the Bureau to follow this operation plan that it will serve all parties well. The Bureau has done a good job of working through this issue.”**

I would like to express my appreciation to the BOR for their dedication to working through, this at times very contentious task of working with the Bighorn River Long Term Issues Group to develop a management plan that will have the best outcome Mother Nature will allow! I strongly encourage the BOR to continue managing Bighorn Lake under the current Rule Curve was recommended by MFWP's as the VARQ model, that Gordon, and Clayton, developed, that was tweaked by Doug Haacke, and agreed to by the Bighorn River Long Term Issues Group! Any major changes to the current rule curve management would need to be approved by the Issues Group.

Thank You  
Keith Grant  
Lovell Wyoming 82431  
[rimrock@tctwest.net](mailto:rimrock@tctwest.net)  
307-272-5511

PS. I have added Appendix 1 pages to support my comments.  
Thank You

December 12, 2006

Mr. Dan Jewell, Manager  
Montana Area Office  
U.S. Bureau of Reclamation  
2900 4<sup>th</sup> Avenue N.  
P.O. Box 30137  
Billings, MT 59107-0137

Dear Mr. Jewell,

Thank you for your letter of November 17, 2006, in which you proposed convening an advisory committee "to provide a forum to identify and analyze potential options to optimize the multipurpose benefits of the Yellowtail Unit." While we agree that an advisory committee would be beneficial, our ambitions for that group are not fully realized in your proposal. We agree that public safety and water law cannot be compromised, but your exclusion of "contractual obligations" from the committee's purview would seem to ignore your overriding contract with the American people to provide multiple benefits in an equitable manner. In addition, now that we have read the memoranda of agreement between the Bureau of Reclamation and the National Park Service, we are not sure that it isn't the Park Service that has the legal power to regulate the reservoir water level, despite recent history.

Big Horn County, Wyoming, wants the advisory committee to be more than window dressing, and the operation of Yellowtail Dam to be open and transparent. We believe that the committee needs to represent more than government agencies, and should include citizen advocacy groups, such as Trout Unlimited, Friends of Bighorn Lake, Ducks Unlimited, and others.

So, again, thank you for your letter, but, at this time, we believe there are some other issues that need to be resolved before an advisory committee can be formed and installed in a meaningful way.

Sincerely,

Keith Grant, Commissioner  
Big Horn County, Wyoming

**AUG, 2006, LOVELL, WY  
FRIENDS OF BIGHORN LAKE MEETING  
QUOTE FROM KEN FRAZIER, M.F.W.P.**

**“WE’VE NEVER HAD A REPRODUCTION PROBLEM IN THE BIG HORN RIVER EVEN THOUGH THERE’S A LOT OF REPRODUCTION, THERE’S ENOUGH MAIN CHANNEL SPAWNING, THAT EVEN THROUGH THE DROUGHT, WE’VE SEEN GOOD PRODUCTION. BUT VERY FEW OF THOSE FISH ACTUALLY RECRUITED INTO THE POPULATION, THEY JUST FED THE BIG FISH THAT ARE ALREADY IN THE RIVER. AND WE SAW THAT, BOTH IN THE LACK OF INTERMEDIATE SIZE FISH AND ALSO IN IMPROVED CONDITION AND SIZE OF THE BIG FISH. I’VE BEEN WORKING HERE FOR 18 YEARS AND 2 YEARS AGO (2004) WAS THE BEST FISHING I HAD EVER SEEN DOWN THERE. THERE WEREN’T A LOT OF THEM DOWN THERE, BUT THE ONES THAT SURVIVED AND WERE EATING LITTLE TROUT, THEY WERE REALLY BIG AND IN GREAT CONDITION.”**

**THIS QUOTE WAS GIVEN SHORTLY AFTER MR. FRAZIER SAID THAT BETWEEN 2001 AND 2005 THE RIVER HAD BEEN AT OR BELOW 1500CFS FOR CLOSE TO THREE YRS.**

**OCT 2<sup>ND</sup>, 2006, DURING THE M.F.W.P. MEETING IN BILLINGS, IT WAS SAID BY M.F.W.P. COMMISSIONER THAT ANYTHING BELOW 1500CFS WOULD BE DEVASTATING TO THE FISHERY ON THE BIG HORN RIVER.**

**ONE SAYS “DEVASTATING”, ONE SAYS “BEST EVER”**

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## TOURISM REGIONS



## Bighorn River

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**Overview:** Prior to 1968, a fishing guide probably would not even mention the Bighorn River, but the building of the Yellowtail Dam created an exceptional tail-water fishery. Today, outdoor writers label it as possibly the best trophy trout fishery in the lower forty-eight states. And the word is out. Even on an early spring day in April, there might be over 100 boats on the upper 13 miles of river in one day. The consistent good fishing provided by stable cool water flows from the dam bring anglers in large numbers to the Bighorn year-round.



**Key species:** Brown trout, rainbow trout, mountain whitefish, golden eye, burbot, smallmouth bass, catfish.

**Use:** Heavy, with a concentration on the 13 miles below the dam. The upper section ranks 8th statewide for fishing pressure.

**Key flies and lures:** Flies-Sow Bugs (soft hackle), Scuds, CDCs, Pale Morning Duns, Midge Clusters, Adams, Light Cahill, Midge Pupa, Olive Woolly Bugger, Yellow Bighorn Special Lures-Mepps, gold brass, Rapala Bait-worms.

**The fishing:** The building of Yellowtail Dam changed this silt-laden river into a clear, superb tailwater fishery. By flooding the 71-mile canyon, the dam not only trapped the silt, but also created a giant heat sink which moderates the temperature extremes of Montana weather. Trout grow in temperatures between 44 and 66 degrees Fahrenheit. The water in most trout streams comes between these two temperatures only about three months of the year, but in the Bighorn River where the water comes from 200 feet below the surface of Bighorn Lake, the growth period doubles from mid-June to mid-December.

The limestone watershed adds its rich minerals to the temperate water. Trout food, sow bugs, scuds, caddis larva, mayflies, midges, and baitfish, flourish in such salubrious conditions. The clarity of the water allows sunlight to reach the bottom, giving rise to a profusion of moss and long, stringy weeds. In short, the conditions are terrific for browns and rainbow.

Numbers normally make for boring reading, but the Bighorn numbers are so impressive they cannot be ignored. The river has not been planted with rainbows since 1983, but the Bighorn averages over 2,900 trout over 13 inches per mile. Consider John Navasio's Bighorn record 16-pound, 2-ounce rainbow. And note that the average fish captured measures better than 15 inches long. The Beaverhead, itself a tailwater fishery, has even

better statistics. But, as anyone who has fished both rivers can testify, an angler has a much tougher time coaxing trout from under the willow jungle along the Beaverhead's banks than from the open riffles of the Bighorn. George Anderson, who runs the Livingston fly shop and guide service called Yellowstone Angler, writes that

". . .when the fishing is hot on the Bighorn, it is possible for a good fisherman to catch and release more than 50 trout in a day, most of which will be in the 15"-20" class. Rainbows and Browns up to 22" and 4 pounds."

The average angler catches one rainbow for about every four brown trout on the Bighorn, but FWP electrofishing surveys show that in some stretches browns outnumber rainbow by a whopping nine to one ratio. Browns started dropping out of the tributaries and populating the main river as soon as the dam made the Bighorn suitable. Now, thanks to the regulated temperature of water flows in November and December, the browns' spawning success is nothing short of phenomenal. Pat Marcuson, a fisheries biologist and author of *Fishing the Beartooths*, wondered if too much of a good thing might not end up being bad news. "If we have two successive years of strong recruitment, we might have lots of snaky browns chasing a limited amount of food."

Marcuson's words proved prophetic when, in 1986 and 1987, the brown trout population rocketed to a record high of 8,459 fish per mile. As more browns crowded into the river, mortality rates for the larger fish (four years and older) reached 99 percent. The reason for this was clear. A riverine ecosystem will only produce so many pounds of trout food, which in turn will feed only so many inches of trout. Intense competition for food by smaller browns seriously hurt the condition and numbers of the large brown trout.

Ironically, it took a drought to rescue the big browns from their own kind. As flows in the Bighorn dwindled during the dry years of 1988 and 1989, water temperatures also decreased, and the number of brown trout per mile plummeted to 4,601—a reduction of nearly 46 percent from the 1987 population. In recent years, high water flows have had an affect on both fishing and hatches. Flows of up to 15,000 cubic feet per second (cfs) and higher result from trouble coordinating spring runoff and irrigation needs between Wyoming and Montana. Despite this dramatic decline, the number of big browns that are 18 inches or longer actually increased to about 400 fish per mile. Unfortunately, this boom and bust scenario may repeat when aquatic conditions once again favor brown trout reproduction.

The Bighorn's rainbow fishery was once supported almost entirely from state hatcheries. Anglers, and especially commercial guides, loved the hatchery fish because they could catch the showy trout more easily than the browns, and the bows put on weight faster than the browns, becoming what are known locally as "Bighorn swimming pigs," fish with small heads and big, deep bodies. These stocked fish grew up to 24 inches.

But the planted rainbow quickly became successful spawners, and the last of the hatchery fish were planted here in 1983. Today, the rainbow population is gaining on the browns, and these wild rainbow are a more durable, if slightly smaller, fish than their hand-fed ancestors. Currently, the average rainbow in the Bighorn measures a plump 18 inches long.

One fish that is usually conspicuous in the cast of characters on other Montana trout streams rarely shows up in the Bighorn--the whitefish. Perhaps the browns eat whitefish fry and the generally unpopular fish has never established a good foothold in the Bighorn. FWP speculates that nitrogen supersaturation from the operation of Yellowtail Dam may help suppress any whitefish recruitment. Nevertheless, anglers now report catching whitefish where they were previously unreported. Curt Collins thinks this may be due to the increased nitrogen problem which has worsened in recent years because of higher flows.

Another fish that has shown up recently in big numbers is the golden eye. These are primarily warm water fish, living in the lower reaches of the Bighorn, but as the summer water temperatures rise, schools of golden eye move into the upper stretches.

The Bighorn runs at an average of 3,000 cubic feet per second, which makes it considerably larger than the Big Hole or the Madison. Except in a few of the wider riffles, anglers find they cannot wade across the river. Fluctuations in water levels for power purposes do not pose a threat to safety as they do on the Flathead or Kootenai. Because the streambed is made up of small rocks and gravel, anglers have good footing. In fact, the bottom seems almost cemented in place because of the lack of a spring runoff which would loosen up the aggregate.

The river heads from the afterbay to the Yellowstone in relatively straight fashion. Bill Haviland, who worked for the Park Service's Bighorn Canyon National Recreation Area, estimates about 20 islands braid the course of the first 13 miles. The river has no whitewater to speak of, but moves at a moderate clip between its relatively stable banks. Here and there, cottonwoods have fallen in making a hazard for boaters. Also watch for the whirlpool about 1 mile downstream from Afterbay Dam and the short set of rapids below the gray bluffs, about 9 miles downstream from the afterbay.

Haviland calls attention to another hazard. Because of the reservoir-caused time lag in the spring, the water remains very cold even in mid-June. On hot June days, Haviland wears a T-shirt, while adding long underwear under his trousers and waders to protect against chilling. Neoprene waders with insulated boot feet can solve this problem.

Between the afterbay and Hardin, the river flows through the Crow Indian Reservation. While the Crows have historically shown little interest in fishing, they have contested the right of non-Indians to float and fish the Bighorn. The state diplomatically closed the river until the Supreme Court ruled the water belonged to Montana and not exclusively to the tribe.

When the state reopened the river to fishing in 1981, there was some initial tension between Crows and non-Native Americans. While the bad feelings have since calmed down, anglers should be aware of the sensitivity of the situation. In particular, anglers must stay within the high water marks unless they have permission from the landowner. FWP defines the high water mark as "the continuous area where vegetation ceases."

With all the publicity of the Supreme Court case and enthusiastic reviews of the subsequent fishing, anglers have predictably flocked to the river, and angling pressure has become a problem. FWP figures show that use peaks in mid April through May and then again in mid August through September. Weekends and holidays bring by far the largest crowds.

Angling pressure has certain predictable results. First, trout become more educated and selective. On the Bighorn, FWP studies show that only one of twenty fish caught on average will be kept. The returned fish reassume their feeding stations with an increased skepticism of feathered and metallic offerings.

Outfitters George Anderson and Curt Collins both acknowledge that the fishing is far more difficult now than immediately after the river was reopened.

Second, social problems develop. Anglers put their boats in and float down the river only to find their favorite holes already occupied. Anglers who have already staked out a spot get miffed at other anglers floating through their fishing water. On the Bighorn, FWP has tried to alleviate this problem by purchasing additional access sites. It would also help the situation if more anglers utilized the lower half of the river. This section holds somewhat fewer fish and the water is often too cloudy for fly fishing, but those fish see far fewer hooks than their upstream brethren.

Third, some anglers become concerned about how many fish are being taken out of the river. Those anglers push for more restrictive limits or "catch and release only." Other anglers who like trout on their tables protest. FWP biologists sit in the middle, listening to both sides and working to determine what would be best for the resource.

Shortly after the Bighorn River re-opened to fishing in 1981, a meeting was held by FWP to air such differences of opinion. Don Tennant strongly supported a return to a more liberal limit, or no limit at all. He argued that a river can only support so many pounds of trout. Trying to "stockpile" extra fish by tightly limiting the creel limit only results in more but smaller fish. As a corollary, Tennant rejected regulations which discriminate against anglers who wish to use bait. Tennant suggests such regulations unfairly treat older anglers and kids, who are most likely to depend on bait to catch their trout.

Anderson and several others countered that the limits should be imposed to protect the larger fish. "What we're seeing is a real reduction in trophy class fishing. It's a shame that such a great fishery is being pounded down." Anderson added that "the rainbow in the 4- to 6-pound category are really getting wiped out." Almost a decade later, Anderson notes that, "the big rainbows did get nearly wiped out in just a few years. Even a one fish limit on rainbows didn't help." As for Tennant's suggestion on bait, the fly and spin sponsors point out that a trout usually swallows bait deeply and will die whether or not the angler puts it back in the river or in the cooler.

In 1988, FWP reached a compromise between the two points of view by establishing a relaxed limit on browns, which seem able to hold their own under intense fishing pressure, while protecting rainbow, particularly larger ones. Current regulations split the Bighorn into three sections. In the uppermost 12 miles of river, from the steel cable below Afterbay Dam to Bighorn Fishing Access Site (FAS), there is a five trout limit, only one of which can measure over 18 inches. Rainbows are catch-and-release only, and no bait-fishing or motor boats are allowed. From Bighorn FAS downstream to the Interstate-90 bridge at Hardin, bait-fishing and motors are permitted, and anglers may keep one rainbow. The five-trout limit, of

which only one can be over 18 inches, also applies to this reach of river. Downstream from I 90, motors and bait-fishing are allowed, and the limit is ten trout with no restrictions on species or length.

Other than the difficulties with access and fishing pressure, anglers may have one other, less immediate, problem to worry about. The Bighorn's proximity to Montana's coal fields may make it tempting to extract water for a slurry pipeline. While not currently a threat, this possibility would prove a nightmare for the fishery if it became a reality.

Until such a disaster befalls the Bighorn, anglers will continue to try for the trophy fish. Success does not come easily, but many anglers feel the fun is mostly in the chase and not the catch. Haviland remembers one haunting day with great enjoyment. On this particular day, he was having little success until he tied on a shrimp imitation and cast up in a riffle. "All of a sudden the line stopped and wouldn't budge. I was just starting to think I'd hooked a log when it took off. In one run, it took out my 40 yards of line and 70 yards of backing. I ran after it, but it straightened the hook and got off."

Instead of getting depressed about losing a lunker, Haviland relishes the experience. His parting words: "Ain't fishin' great!"

**Strategies:** As with almost all trout streams and rivers, a small percentage of anglers catch most of the fish on the Bighorn. What do these successful anglers know or do that other anglers don't? A number of factors figure into the answer, but several experts suggest that adaptability makes the biggest difference.

Successful Bighorn anglers are willing to change their strategies, methods, and offerings if their first try of the day doesn't produce fish. If trout don't take dry flies, try a nymph down deep. If a brass spoon hasn't produced a strike in half an hour, put on a lure with a different color or action. Six great-looking riffles and not a strike? Try the banks and the deep pools.



Vince Ames fishes the Bighorn frequently. While he would modestly argue that he is not an expert, other anglers note that Ames catches many more fish than the average angler. Ames tries to arrive at the riverbank without preconceptions. "Be open-minded and keep loose" until observations show the angler what to try first. Is there any surface activity? If so, are the fish actually feeding on the surface, or are they nymphing just below the surface film? If Ames sees no surface activity, he then decides either to fish a nymph deep or to try a streamer. If he decides on nymphs, he tries to figure out by observation whether to use a mayfly nymph, which swims, or a caddis larvae imitation, which should be presented on a dead drift.

Anderson suggests that his clients bring along two outfits, one a 8.5-9 foot number 3 or 4 line rod for fishing dry flies and the other a number 5 or 6 line rod with a floating line for fishing nymphs. In the fall a number 7 line rod with sink tip line is a useful tool for fishing Woolly Buggers and streamers. For fishing dries, 5x and 6x tippets on 9 to 12 feet of leader is the norm while 4x and 5x will work fine for fishing nymphs.

Collins points out that from November to the first of May, the fly fishers use mostly nymphs and streamers, while from May to November the

angler can add dry flies to the arsenal. Midge hatches that begin in February do provide some good early season dry fly fishing, especially on cloudy windless days. Small Adams, midge clusters, and many other midge patterns in size 22 to 16 work well. Towards summer, Collins also recommends CDC patterns, pale morning dun parachutes and in 1996 he noted that there was a good golden stone hatch.

For mayfly imitation, Collins likes patterns such as Adams, Blue Duns, and Blue Quills in size 14 to 18; Blue Wing Olives and Light Cahills 16 to 20; Mosquitoes; and CDCs are a good choice throughout summer and fall. Collins ties his own version of the CDC and notes that the oil gland feather off a duck keeps it dry and you can tie it to be very visible. For caddis, Collins rates the Elk Hair Caddis as a "great fly" and adds that both tan and black can be successful, with black being the better choice. Collins adds some terrestrial patterns for hoppers, ants, and spiders. Anderson does not pin any hopes on hoppers. Only occasionally does the hopper fishing on the Bighorn become important on years when there is an infestation of grasshoppers.

In the nymph department, Scud and Sow Bug patterns get high marks for effectiveness any time of the year. Collins notes that the best pattern has become the Sow Bug. High flows in the 1990s made the Sow Bug the rivers number one food source. Scuds still work year-round and a San Juan Worm may also take fish. Anderson's "hot nymph patterns" include Soft Hackle Sow Bug patterns, Gray Sparkle Scuds, Flashback P.T.'s and a variety of Midge Pupa.

When fishing nymphs deep, Anderson often uses a buoyant indicator placed 7-to 9-feet up on a 12 foot leader. One or more BB size split shots are placed on the leader above the tippet knot 18 inches from the nymph. Anderson often uses two or more nymphs tied in tandem fashion, from the bend of the first fly to the second with about 12 inches separating the nymphs.

The Bighorn has some outstanding streamer and spin fishing waters. Some of the streamers mentioned by Anderson and Collins are Olive Woolly Buggers, light and dark Spruce Flies, brown Matukas, Zonkers, black Nose Dace, and white Marabou Muddlers. However, a yellow streamer called the Bighorn Special might be the most popular fly of all on the river. Streamers for the Bighorn should be of the larger variety such as a size 8.

The Bighorn's moss can hamper spin fishing from April to mid-October. Otherwise, spin fishing can be dynamite. Haviland recommends Mepps, sometimes with feathered hooks. He thinks the smaller sizes are best. Brass is most effective; gold can be good, while silver, in Haviland's experience, does not do as well. However, the lure that tops most recommendation lists is the gold number 5, 7, or 9 Rapala. "It's just awesome what they can do," says Collins.

Bait anglers plying the lower river almost always use worms. Navasio's record rainbow was taken in by the standard nightcrawler. As mentioned before, bait anglers should be aware of special regulations.

Haviland has two strategies for anglers to consider. The first is a dropper rig. At the end of his leader Haviland ties on a Muddler Minnow or a Bighorn Special. 2 or 3 feet up the leader, he ties on a separate 6-inch

strand of leader with a black hair fly dangling at the end of it.

This dropper rig does not just present the trout with a choice of flies. The real intention is to make the hair fly look like an egg-laying caddis fly as it dips to the water's surface. The large streamer acts as an anchor. With a little practice, the angler can play the tension in the line so that the dropper fly will bounce, skitter, and tease any trout that is keying in on one of the Bighorn's prolific caddis hatches. The dropper rig has become the preferred way to nymph fish. Using two flies allows you to prospect with two different patterns to see what the fish are biting.

The dropper rig method may sound complicated and too tricky to skeptical anglers, but it is a proven producer. In 1935, Charlie Cook caught an 11-pound-plus brown on the Big Hole in western Montana employing this same tactic. When anglers see caddis flies fluttering just above the river surface, they might do well to try the dropper fly.

Haviland's other unconventional method will not appeal to the weak of heart nor to those who like to catch a suntan while they fish. Mature trout, especially browns, are notoriously nocturnal in the summer. Almost all anglers have witnessed the voracious feeding which so often takes place as the light dims after sunset. While most anglers head home at this time, Haviland finds nightfall a good time to start his fishing.

Haviland explains that as the light level drops, the big browns feel safe enough to come out of their deep pools and into the shallow riffles. With the help of a full moon, he has seen big fish practically on the rocks, fins out of the water, looking like a pack of hungry sharks. Haviland feeds them something substantial like a Muddler Minnow on the end of stout, 10-pound test leader. He stresses that the night is a smaller world where you can catch fish right up to your feet. There is no need for 90-foot casts at night, provided a stealthy approach is made.

Obviously, it helps to know the section of the river very well from past experience. Falling into a river over the top of the waders at night could be scary, even dangerous. And there can be little surprises, such as one night when a startled beaver slapped his tail right next to Haviland. But the fishing can be prime; in a two-hour stand in one pool, Haviland once caught eleven fish between 18 and 22 inches long.

What kinds of water do the experts fish on the Bighorn? Guide Mike Mouat likes the inside corners and the deeper banks. Anderson looks for tailouts for sight fishing nymphs. Deep flowing water along banks or weeds are prime dry fly spots. Collins fishes just off the heavier water or where the heavy water hits the slack. He notes that trout are very opportunistic and follow the hatches feeding in different areas of the river depending upon the food source. This sometimes means fishing with nymphs in the riffles or below the riffles with sow bugs. Collins also keys in on the rare spots with gravel because the fish really seem to like it there. Haviland notes the drift lanes between the moss beds.

The Bighorn remains ice-free and open for fishing year-round. January and February rate as the slowest months, but even they can be good. Summer and fall are the most popular times, but warmer winter days also bring local anglers to the river to cure their cabin fevers. Water releases are more constant now in comparison to earlier years, and water levels remain

at a given level for several weeks. Some higher releases may occur in spring in anticipation of heavy snow melt.

Rivers with giant reputations sometimes have a way of disappointing anglers, especially neophytes. Collins sees lots of beginners with these "delusions of grandeur." Even though the Bighorn is an open river full of trout, it is not easy pickings for those who will not take the time to study its subtleties and learn the water. The fishing here especially favors the adaptable angler who, if he fails in his first try, goes on to try a different fly or lure or a different way of fishing them. While other anglers continue to flail away at the water uselessly in the same ineffective way, for the adaptable angler, good things can happen at any time.

### Tributaries

The Montana section of the Bighorn has one tributary of note to anglers, the Little Bighorn River. This river carries a heavy silt load at times, but the upper reaches in particular have some good fishing. However, the Little Bighorn runs entirely within the boundaries of the Crow Reservation and access to it is next to nil.

### Access [\[map\]](#)

"It is unlawful to go upon tribal, trust, or allotted lands on the Crow Reservation for the purposes of hunting, fishing, or trapping." (18-USC 1165) Thus it is imperative that anglers wishing to fish the Bighorn from Hardin to Yellowtail Dam reach the river either through FWP's fishing access sites or National Park Service land.

The uppermost of these is just below the bridge across the river from Fort Smith and immediately downstream from the Afterbay Dam. Next, about 3 float miles down, is NPS Lind Ranch Access. Twelve more miles down is FWP's Bighorn Access. These three sites currently receive the brunt of visitation.

A very long day's float (about 19.5 miles) down from Bighorn puts the angler at Two Leggins Access. From there, an 11-mile float past Hardin to the edge of the Crow Reservation ends at Arapooish Fishing Access, just off I 90.

Below the Reservation, there are two more developed sites on the west side of the river. Grant Marsh Game Management Area is about 7 miles north of Hardin. And at the mouth of the Bighorn near the Interstate 94 bridge is the Manuel Lisa Fishing Access. Anglers can, of course, reach the river north of the Reservation by crossing private lands with permission. A map of the river and detailed information for floaters is available in Montana Afloat #14, the Bighorn River.

Power boats are currently prohibited on the Bighorn from the steel cable below Afterbay Dam downstream to Bighorn FAS. FWP has added two access sites, Mallard's Landing and General Custer, to disperse fishing pressure more evenly along the river.

Excerpted from *Fishing Montana* by Michael Sample  
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## LYNDON B. JOHNSON

XXXVI President of the United States: 1963-1969

Tweet

522 - Remarks at the Signing Ceremony for Seven Conservation Bills.  
October 15, 1966

Lyndon B. Johnson  
1966: Book II

Secretary Udall, Senator Mansfield, Senator Jackson, Senator Bible, Congressman O'Brien, Senators from the States involved, Members of Congress, Mrs. Johnson, ladies and gentlemen:

**We have come here this morning to give part of our country back to its people.**

When our forefathers came here they found nature's masterpiece. They found a beautiful, rich, varied, fertile land, a whole continent to farm and to hunt on, and to explore.

As Robert Frost said, "The land was ours before we were the land's. She was our land more than a hundred years before we were her people."

Our pioneer fathers made this beautiful land a great nation. But when the wave of settlement reached the Pacific, it turned back upon itself. America began to exploit the land. We chopped down its forests. We abused its soil. We built upon its beaches.

Some Americans realized our loss--Gifford Pinchot, John Muir, Theodore Roosevelt, Franklin Roosevelt, Harold Ickes. They saw that America could be great only as long as Americans could commune with the land. They were the architects of American conservation.

Today our crowded country thanks them--thanks them for their courage and for their vision, and for their generosity.

This year we reach a milestone in the history of conservation. This year, thanks to the 89th Congress, we will restore more land for more parks, for more playgrounds for our children to use, than we will lose to housing ventures, to highways, to airports, and to shopping centers.

**We are creating recreation areas where they will do the most good for the greatest number, for all of our people--near our cities,** where most of our people live. **We are** putting national parks and seashores where a man and his family can get to them.

**The father that is the mechanic can load his five children in his car, and in an hour or 2 hours, or 3 hours, take them to a nearby playground.**

The 89th Congress has done all of this. It has enacted 20 major conservation measures. Today we pay tribute to that Congress. Today we establish by act of Congress:

--The Guadalupe Mountain National Park in Texas. That is a great tribute to the Senator from Texas, Senator Yarborough, who has been the outstanding leader in conservation in that State.

--The Pictured Rocks National Lakeshore in Michigan.

--**The Big Horn Canyon National Recreation Area in Montana.**

--The Wolf Trap Farm Park in Virginia.

We increase the land in the Point Reyes National Seashore in California. And if we don't stop Mrs. Johnson going out there we will increase it some more, I am afraid.

I am also signing today the endangered species preservation act and the national historic preservation act. Both of these will help us to preserve for our children the heritage of this great land we call America that our forefathers first saw.

The bills that I will now sign help enrich the spirit of America.

These acts of Congress help assure that this land of ours--this gift that is outright from God--shall be the most precious legacy that we leave.

I want to express my gratitude to the leaders of the parks movements, the recreation areas, the State commissions and their executive directors, for their enlightened interest, for their support, and particularly for the presence of a good many of them this morning.

---

*Note: The President spoke at 11:18 a.m. in the Cabinet Room at the White House. In his opening words he referred to Secretary of the Interior Stewart L. Udall, Senator Mike Mansfield of Montana, Senator Henry M. Jackson of Washington, Senator Alan Bible of Nevada, Representative Leo W. O'Brien of New York, and Mrs. Lyndon B. Johnson. Later he referred to, among others, Senator Ralph Yarborough of Texas*

*... enacted, the bills signed by the President are as follows:*

*S. 491 (Bighorn Canyon National Recreation Area, Mont. Public Law 89-664 (80 Stat. 913) .*

*S. 3035 (National historic preservation) Public Law 89-665 (80 Stat. 915)*

*S. 1607 (Point Reyes National Seashore, Calif. Public Law 89-666 (80 Stat. 919)*

*H.R. 698 (Guadalupe Mountain National Park, Texas) Public Law 89-667 (80 Stat. 920)*

*H.R. 8678 (Pictured Rocks National Lakeshore, Mich.) Public Law 89-668 (80 Stat. 922)*

*H.R. 9424 (Endangered species preservation) Public Law 89-669 (80 Stat. 926)*

*S. 3423 (Wolf Trap Farm Park, Va.) Public Law 89-671 (80 Stat. 950)*

---

**Citation:** Lyndon B. Johnson: "Remarks at the Signing Ceremony for Seven Conservation Bills.," October 15, 1966. Online by Gerhard Peters and John T. Woolley, *The American Presidency Project*. <http://www.presidency.ucsb.edu/ws/?pid=27929>.

## Briefing Statement

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**Bureau: National Park Service**

**Issue: Bighorn Canyon NRA and Little Bighorn Battlefield Legislation**

**Park Site: Bighorn Canyon National Recreation Area**

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**Background:** The present boundary of Bighorn Canyon includes approximately 56,000 acres of Crow Indian Reservation lands. There was controversy when the lands were included, and controversy continues today. As a consequence of these actions, Bighorn Canyon NRA has been restricted in park planning, management, and development on the Crow Reservation lands. The General Management Plan for the park, completed in 1981, conceded this point and limited park planning to those lands originally included in the 1966 Act of Congress (P.L. 89-664), which specifically excluded Crow Tribal lands. The impasse has left the recreation area in the precarious situation of having lands within its boundaries that are unmanageable in accordance with its enabling legislation.

Little Bighorn Battlefield NM's approved General Management Plan (1995) calls for expanding the park boundary from its current 765 acres to 11,800 acres. The land surrounding the Monument has seen markedly increased commercial developments in recent years. Such developments threaten to intrude on the experience of visitors and irrevocably alter physical features of the landscape that are crucial for understanding what took place at the Battle of the Little Bighorn. Expanded land base would add important elements of the battle, including Reno's first skirmish line and the Indian encampment, to the monument for protection and preservation.

Legislation is needed to add certain key lands within the Crow Reservation to Little Bighorn Battlefield National Monument and to withdraw certain Crow Lands from Bighorn Canyon National Recreation Area. The legislation would be developed as one piece, with two distinct titles. Linking the two boundary changes--an addition to Little Bighorn Battlefield and a subtraction from Bighorn Canyon NRA--will help to enlist support for the legislation from Crow Tribal Council and other stakeholders.

### **Current Status:**

- Legislation for a boundary expansion at Little Bighorn was introduced by Senator Ben Nighthorse Campbell in the 107<sup>th</sup> Congress (S1338).
- Consultations between the Crow Tribe and Park have taken place over the last four years to review the proposal. General maps with tract locations were furnished to the Crow Tribe including copies of public documents.
- The Park briefed the Montana Congressional delegation staff and the Montana Fish, Wildlife and Parks on a proposed legislative change for both Park units.
- The Parks and Crow Tribe have reached a tentative agreement on a draft legislative package. The draft legislation is awaiting action by the Crow Tribal Administration and Legislators.
- The Park and Regional Offices are generally supportive of the draft bill and have participated with the Crow Tribe in negotiations.
- Public meetings held in Fort Smith and Billings, Montana.

Montana Water Court  
PO Box 1389  
Bozeman, MT 59771-1389  
1-800-624-3270 (In-state only)  
(406) 586-4364  
fax: (406) 522-4131

**IN THE WATER COURT OF THE STATE OF  
MONTANA  
NATIONAL PARK SERVICE-MONTANA COMPACT**

\*\*\*\*\*

IN THE MATTER OF THE ADJUDICATION )  
OF EXISTING AND RESERVED RIGHTS TO ) CASE NO. WC-94-1  
THE USE OF WATER, BOTH SURFACE AND )  
UNDERGROUND, OF THE NATIONAL PARK )  
SERVICE WITHIN THE STATE OF MONTANA )

**FINDINGS OF FACT AND CONCLUSIONS OF LAW  
APPROVING AND CONFIRMING THE**

**UNITED STATES NATIONAL PARK SERVICE-MONTANA COMPACT**

THIS MATTER came before the Court on a joint motion of the State of Montana and the United

States of America for approval of the United States National Park Service-Montana Compact, § 85-20-

401, MCA. Based on the submissions of the State and the United States, the Compact and the record

in this case, the Court now issues the following:

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Bighorn Canyon National Recreation Area. The Bighorn Canyon National Recreation Area was first established by Act of Congress on October 15, 1966, "for public outdoor recreation use and enjoyment of the proposed Yellowtail Reservoir and lands adjacent thereto. . . . and for preservation of the scenic, scientific, and historic features contributing to public enjoyment of such lands and waters. . . ." Act of October 15, 1966, 80 Stat. 913. *See also* Compact art. I(3), § 85-20-401, MCA; Technical

12. Negotiation on the last two NPS units resumed following the 1993 session of the Montana Legislature. As in previous negotiations, meetings were open to the public, and informational open houses were held in Lodge Grass and Billings. Because both NPS units are located primarily within the Crow Reservation, the Commission and the Park Service met with the Crow Tribal Council to explain the Compact and to seek comments from the Tribe. The second **Compact quantifying the federal reserved water** rights for the Little Bighorn Battlefield National Monument and **Bighorn Canyon National Recreation Area** ("Compact II") was unanimously approved by the Commission in December of 1994. Tweeten Aff., at 2; Technical Report, at 4.

The United States Park Service–Montana Compact

15. The United States Park Service–Montana Compact was entered into for the purpose of “settling for all time any and all claims to water for certain lands administered by the National Park Service within the State of Montana at the time of the effective date of this Compact,” which included the Big Hole National Battlefield, Glacier National Park, Little Bighorn Battlefield National Monument; **Bighorn Canyon National Recreation Area**, and Yellowstone National Park. Compact, § 85-20-401, MCA.

16. Article III of the Compact sets forth the federal reserved water rights for that part of the five NPS Units situated in Montana. To more easily address the issues involving the reserved water rights for the five NPS Units,

*In Cappaert v. United States*, the United States Supreme Court described the doctrine as follows:

**This Court has long held that when the Federal Government withdraws its land from the public domain and reserves it for a federal purpose, the Government, by implication, reserves appurtenant water then unappropriated to the extent needed to accomplish the purpose of the reservation.** In so doing the United States acquires a reserved right in unappropriated water which vests on the date of the reservation and is superior to the rights of future appropriators. The doctrine applies to Indian reservations and other federal enclaves, encompassing water rights in navigable and nonnavigable streams. In determining whether there is a federally reserved water right implicit in a federal

-18-

**Pg 23**

reservation of public land, the issue is whether the Government intended to reserve unappropriated and thus available water. Intent is inferred if the previously unappropriated waters are necessary to accomplish the purposes for which the reservation was created.

**In United States v. New Mexico, the United States Supreme Court explained that**

While many of the contours of . . . [the doctrine] remain unspecified, the Court has repeatedly emphasized that Congress reserved ‘only that amount of water necessary to fulfill the purpose of the reservation, no more.’... **Where water is necessary to fulfill the very purposes for which a federal reservation was created**, it is reasonable to conclude,

even in the face of Congress' express deference to state water law in other areas, that the United States intended to reserve the necessary water. Where water is only valuable for a secondary use of the reservation, however, there arises the contrary inference that Congress intended, consistent with its other views, that the United States would acquire water in the same manner as any other public or private appropriator

V

**COMPACT PRESUMED FAIR, REASONABLE, AND ADEQUATE**

In deference to Montana's policy of encouraging the negotiation and settlement of federal reserved water rights through the statutory compacting process, and in the absence of any evidence of fraud, coercion, or overreaching by the parties, the Montana Water Court presumes that compacts concluded through that process are "fundamentally fair, adequate, and reasonable."

## VII

### APPROVAL AND CONFIRMATION

The Settling Parties's Motion for Approval of the United States National Park Service - Montana

Compact is **GRANTED**. The Compact is **APPROVED** and **CONFIRMED**. Entry of Final Judgment

and issuance of a Rule 54(b) Certification will occur at a later date.

DATED this day of , 2005.

---

C. Bruce Loble

Chief Water Judge

Helena MT 59620-1601

## Montana

### CHAPTER I - WATER RESOURCES CONSERVATION, DEVELOPMENT AND ADMINISTRATION

#### Pg 24

(22) "Nonconsumptive Use" means a beneficial use of water reserved or identified by this Ordinance to remain in a stream, aquifer, or body of water, which does not significantly *reduce or impair* the quantity or quality of the remaining water. [*what about timing?*] Nonconsumptive uses include, without limitation, the generation of hydroelectric power, recreation, and uses associated with the protection, preservation, and enhancement of fisheries,

DRAFT Unitary Administration and Management Ordinance 8/5/08 Version

State of Montana comments 9-22-08 Page 11

wildlife, Indian cultural and religious practices and beliefs, water quality, and the vitality of an ecosystem. [*The whole consumptive use v. non-consumptive issue is confusing.*

*Hydropower is both. It might be better simply to delete the examples from the definition.*]

#### *Exhibit A*

### WATER RIGHT CLAIM EXAMINATION RULES AMENDED BY THE MONTANA SUPREME COURT

EFFECTIVE DECEMBER 5, 2006

TABLE OF CONTENTS FOR THE WATER RIGHT CLAIM

## EXAMINATION RULES

(45) "**Non-consumptive**" means a beneficial use of water that does not cause a reduction in the source of supply.

(59) "**Reservoir**" means a storage facility, created or augmented by manmade means that impounds and stores water for beneficial use.

### 1.4.1 The Laws Generally Governing Park Management

The most important statutory directive for the National Park Service is provided by interrelated provisions of the NPS Organic Act of 1916, and the NPS General Authorities Act of 1970, including amendments to the latter law enacted in 1978. Redwood Amendment

Congress supplemented and clarified these provisions through enactment of the General Authorities Act in 1970, and again through enactment of a 1978 amendment to that law (the "**Redwood Amendment**," contained in a bill expanding Redwood National Park, which added the last two sentences in the following provision). The key part of that act, as amended, is:

Congress declares that the national park system, which began with establishment of Yellowstone National Park in 1872, has since grown to include superlative natural, historic, and recreation areas in every major region of the United States, its territories and island possessions; that these areas, though distinct in character, are **united through their interrelated purposes and resources into one national park system as cumulative expressions of a single national heritage; that, individually and collectively, these areas derive increased national dignity and recognition of their superlative environmental quality through their inclusion jointly with each other in one national park system preserved and managed for the benefit and inspiration of all the people of the United States**; and that it is the purpose of this Act to include all such areas in the System and to clarify the authorities applicable to the system. Congress further reaffirms, declares, and directs that the promotion and regulation of the various areas of the National Park System, as defined in section 1c of this title, shall be consistent with and founded in the purpose established by section 1 of this title [the Organic Act provision quoted above], to the common benefit of all the people of the United States. The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly

and specifically provided by Congress. (16 USC 1a?1)

#### 1.4.2 "Impairment" and "Derogation": One Standard

Congress intended the language of the Redwood amendment to the General Authorities Act to reiterate the provisions of the Organic Act, not create a substantively different management standard. **The House committee report described the Redwood amendment as a "declaration by Congress" that the promotion and regulation of the national park system is to be consistent with the Organic Act.** The Senate committee report stated that under the Redwood amendment, **"The Secretary has an absolute duty, which is not to be compromised, to fulfill the mandate of the 1916 Act to take whatever actions and seek whatever relief as will safeguard the units of the national park system."**

So, although the Organic Act and the General Authorities Act, as amended by the Redwood amendment, use different wording ("unimpaired" and "derogation") to describe what the National Park Service must avoid, they define a single standard for the management of the national park system - not two different standards. For simplicity, Management Policies uses "impairment," not both statutory phrases, to refer to that single standard

#### .4.4 The Prohibition on Impairment of Park Resources and Values

**The impairment of park resources and values may not be allowed by the Service**

#### 1.4.5 What Constitutes Impairment of Park Resources and Values

**The impairment that is prohibited by the Organic Act and the General Authorities Act is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values. An impact to any park resource or value may constitute an impairment. An impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is:**

- **Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;**

#### **SUBCHAPTER LXXVIII—BIGHORN CANYON**

#### **NATIONAL RECREATION AREA**

#### **§ 460t. Establishment**

#### **(a) In general; description of area**

**✓ In order to provide for public outdoor recreation use and enjoyment of the proposed Yellowtail Reservoir and lands adjacent thereto**

**in the States of Wyoming and Montana by the people of the United States and for preservation of the scenic, scientific, and historic features contributing to public enjoyment of such lands and waters, there is hereby established the Bighorn**

**Canyon National Recreation Area.**

Yellowstone National Park Act of 1872 (30 U.S.C. §§ 21-22, 17 Stat. 32)  
National Park Service Organic Act of 1916 (16 U.S.C. §§ 1-18f, 39 Stat. 535)

General Authorities Act of 1970 (16 U.S.C. §§ 1a-1 *et seq.*, Public Law No. 91-383)

Redwoods Act of 1978 (16 U.S.C. §§ 1, 1a-1, Public Law No. 95-250)

Federal Government withdraws its land from the public domain and reserves it for a federal purpose, the Government, by implication, reserves appurtenant water then unappropriated to the extent needed to accomplish the purpose of the reservation.

# CHAPTER IV

## RESERVOIR OPERATIONS

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## D. GENERAL FILLING AND RELEASE PROCEDURES

The operation of Yellowtail Dam and Bighorn Lake is based on Reclamation's overall operating objectives and the Corps' responsibility for flood control. In accordance with the Flood Control Act of 1944, the Corps is responsible for prescribing regulations for the use of storage in Bighorn Lake allocated to Flood Control. All other regulatory functions are the responsibility of Reclamation.

Reclamation is solely responsible for regulation of the reservoir when the storage is in the surcharge pool between elevation 3657.0 and below elevation 3660.0. The Corps is responsible for the operations when the reservoir is in the exclusive flood pool (between elevations 3640.0-3657.0). **Between elevations 3614.0-3640.0 (joint-use storage zone), Reclamation and the Corps are jointly responsible.** Reclamation has full responsibility of this zone when the space is not required for seasonal flood control purposes. The use of the joint-use pool for flood control is secondary to the use of this pool for water supply needs. Because of this, a prime operating objective is to **annually fill this joint-use storage space by the end of July.**

Reclamation's Montana Area Office (MTAO), Billings, Montana, Water and Facility Management Group is responsible for the overall operation of Yellowtail Dam and Bighorn Lake. Based on the daily release schedule set by the Water and Facility Management Group, hourly power generation is scheduled by the Western Area Power Administration Power Dispatching Branch located in Loveland, Colorado.

The operating objectives at Yellowtail Dam and Bighorn Lake are to provide desired river and reservoir regulation to maximize the power generation benefit at Yellowtail, provide water for irrigation (senior water rights), municipal use, and industrial use, provide desired river flow conditions to meet the needs of the downstream river fishery, provide desired conditions for fish, wildlife and recreational use in the reservoir, regulate river flow to minimize downstream flood damage, and regulate reservoir levels to minimize potential ice-jam flooding at the mouth of the Shoshone River at the upper end of Bighorn Lake. To accomplish these objectives the reservoir is operated under the following criteria and limitations:

1. Beginning near the first of January and at least monthly thereafter through June, forecasts are made of the estimated spring inflow from snow cover and precipitation data. When these forecasts become available, the Water and Facilities Management Group prepared operating plans for **Yellowtail Dam and Bighorn Lake with the goal of allowing storage to fill to elevation 3640.0 (top of the joint-use pool) while preventing storage from exceeding this level until the peak of the runoff has passed or has begun**

to recede. If releases in excess of full powerplant capacity are required, they are made only to the extent that current inflow and reservoir content indicate that spills are required. Depending on when the spring runoff starts, the release of water, based on inflow forecast, it may be necessary to draw the pool as low as elevation 3600.0 to adequately regulate spring runoff. Drought conditions and the need to meet downstream release requirements may result in the reservoir drafting to a much lower level.

2. When water supply conditions are adequate and once Bighorn Lake has filled or reached its maximum level during spring runoff (normally late June or early July), **releases are adjusted to evacuate storage to near elevation 3635.0 by mid-October** and to near elevation 3630.0 by the end of November. Maintaining Bighorn Lake near elevation 3635 provides desirable waterfowl recreation around the southern area of Bighorn Lake. Historically, it has also been observed that maintaining Bighorn Lake below elevation 3630.0, minimizes ice jam problems in the mouth of the Shoshone River where it enters Bighorn Lake.
3. In late fall, a uniform release from Bighorn Lake to the Bighorn River is scheduled during November through March with the objective of evacuating storage to an elevation between 3605.0-3614.0 by the end of March, depending on the forecasted snowmelt runoff into Bighorn Lake. This attempts to protect the desired reservoir levels for summer and fall lake recreation activities while still providing adequate fall and winter power generation and river fishery needs.
4. When conditions allow it is preferable to establish a winter release near the middle of October or early November that can be maintained through March as this protects the brown trout spawn and fish egg incubation which extends through March.
5. The following **desired fishery flows should be considered and provided when possible**, based on available water supply and the need to meet other operating goals **and reservoir needs**.
  - a. Optimum Fishery Flow: A minimum of 2,500 cfs provides good spawning, rearing and cover conditions in all major side channels.
  - b. Standard Fishery Flow: A minimum of 2,000 cfs provides adequate spawning and rearing conditions in most side channels but cover for adult fish is limited.
  - c. Minimum Fishery Flow: A minimum flow of 1,500 cfs protects main channel habitat but not important side channels. Fish population will decline at this flow rate.
  - d. Absolute Minimum Fishery Flow: **A minimum flow of 1,000 cfs was recognized in the Definite Plan Report as the minimum flow**

that could be maintained during extended drought periods under full water development. Releases below 1,500 cfs may be necessary to prevent the active conservation storage from being fully depleted during a drought.

Except for July, August, September and early October, the other months of the year are considered spawning or egg incubation periods for brown and rainbow trout. For additional information on this, refer to Section L, Fish, Wildlife and Recreation Considerations.

6. When water supply conditions allow, the reservoir should be operated to fill to or above elevation 3614 by the end of May. This minimum level is needed to launch boats at the Horseshoe Bend boat ramp.
7. During years of below normal runoff, releases required to meet downstream needs may prevent Bighorn Lake from reaching the top of the joint-use pool at elevation 3640.
8. All water released from Bighorn Lake is generally released through the Yellowtail Powerplant. Releasing any water in excess of the powerplant capacity (normally 7,500-8,200 cfs) is avoided, except during times of unusually heavy inflow or scheduled powerplant maintenance.
9. Attempts are made to prevent the reservoir level from dropping during April and May to protect walleye spawning activities in the Bighorn Lake.
10. For downstream flood control purposes, river releases should be avoided that would cause flows in the Bighorn River to exceed 20,000 cfs at St. Xavier and 25,000 cfs at Bighorn and 65,000 cfs in the Yellowstone River at Miles City. Refer to Exhibits IV-19 through IV-22 for discharge rating tables for Bighorn River at St. Xavier, Bighorn and for the Yellowstone River at Forsythe and Miles City.
11. During April through October, water is diverted to the Bighorn Canal to meet downstream irrigation demands of the Crow Indian Irrigation Project. Maximum diversions to the Bighorn Canal are presently limited to about 550 cfs. Refer to Exhibit IV-23 for discharge rating table for Bighorn Canal. See Exhibit IV-29, Memorandum of Understanding for the Operation and Maintenance of BOR Constructed Headworks for BIA Bighorn Canal.
12. Every 2 years about mid-October after the irrigation season is over, all storage is evacuated from the Yellowtail Afterbay, except for approximately 200 acre-feet, to allow for measurement of seepage downstream of Yellowtail Dam. During this time, releases to the Bighorn

River are reduced to no lower than 400 cfs for approximately 6 hours.

12. Release rates during the winter are generally not changed or fluctuated more than 100 cfs in 6 hours when the downstream river channel is ice covered.
13. All reservoir and river operations are closely coordinated with the Wyoming Area Office (WYAO) and Western Area Power Administration.
14. All flood control operations are closely coordinated with the Corps of Engineers (CORPS).

## L. FISH, WILDLIFE AND RECREATION CONSIDERATIONS

Management of the Bighorn Lake area for wildlife purposes was established between the Bureau of Reclamation and the Wyoming Game and Fish Department under Contract No. 14-06-600-9160 dated May 11, 1967. See Exhibit IV-27. All of the recreation facilities within the boundaries of the Bighorn Canyon Recreation Area are under the administration of the National Park Service through cooperative agreement No. 98-AA-60-10390. See Exhibit IV-28.

Reservoir levels of concern for recreation is to prevent, if possible, the level from falling below elevation 3614.0, the elevation when the marinas are first impacted, during the recreation season between Memorial Day and Labor Day weekends. If storage is drawn below 3590.0, most of the marinas are severely impacted and many of the boat ramps are unusable. Recreational use on Bighorn Lake is affected when the lake exceeds elevation 3642.0. The Black Canyon recreation area is affected at this level, and if the water level exceeds elevation 3647.0, the recreation area becomes flooded. Floating debris is also a major problem for boaters during high runoff.

3620  
Sitt at H.S.B.

If storage levels and runoff conditions permit, the drawdown during certain periods of the spring will be limited to enhance the spawning and hatching conditions for the reservoir fishery. The fish management personnel from the States of Montana and Wyoming are expected to notify Reclamation when limited drawdown is required, and the Water and Facilities Management Group will determine whether the operation can be made.

There are some restrictions on specific water surface levels in the Afterbay Reservoir for fish, wildlife or recreation. During the irrigation season, the minimum operating level of the Afterbay should be set no lower than elevation 3175.0 to provide appropriate diversions for irrigation. For flatwater recreation on the Afterbay Reservoir, the minimum desirable

operating level of the Afterbay should be no lower than elevation 3176.0 to 3179.0.

Through an informal agreement with the Montana Fish, Wildlife and Parks, whenever an adequate water supply is available, releases from Bighorn Lake to the Bighorn River will be maintained at rates required to sustain river flows equal to or greater than the desired optimum fishery flow of 2,500 cfs below Yellowtail Afterbay Dam, to provide good spawning, rearing and cover conditions in all major side channels. During below normal runoff years, it may be necessary to reduce the releases to the Bighorn River to 2,000 cfs to provide adequate spawning and rearing conditions in most side channels, but cover for adult fish would be limited. During drought conditions, releases to the Bighorn River may be reduced and maintained at 1,500 cfs to sustain the fishery. Fish populations will decline, and nearly all of the important side channels would be dewatered at this level. Extended drought conditions may require further reductions in the river release to a designed minimum flow of 1,400 cfs during the irrigation season and 1,000 cfs during the non-irrigation season. During emergency or special operations, such as the seepage measurements taken every 2 years, releases to the Bighorn River from the Afterbay may be reduced to as low as 400 cfs for a short period of time with coordination with the FWP.

One of the operating objectives at Yellowtail Dam and Bighorn Lake is to provide desired river flow conditions to meet the needs of the downstream river fishery and to provide desired conditions for fish, wildlife, and recreational use in Bighorn Lake and the river above Bighorn Lake. Significant changes in releases to the stream below the dam should be made in incremental changes, whenever possible, to minimize disturbance of the stream aquatic life.

## M. RESOURCE MANAGEMENT PLAN

In accordance with Public Law 89-664, S. 491, the Bighorn Canyon National Recreation Area was established. Administration of the lands and resources are to be shared by the National Park Service and the Bureau of Reclamation as detailed under Cooperative Agreement No. 98-AA-60-10390. Through this agreement, resource management plans are the responsibility of the National Park Service.

Several recreation areas have been developed around the Reservoir's shoreline. These are the Kane Bridge Recreation Area, Horseshoe Bend Recreation Area, ( Wyoming facilities ) Devils Canyon Overlook, Barry's Landing Recreation Area, and OK-A-Beh Recreation Area near the dam and the Visitor Center at the top of Yellowtail Dam. These recreation facilities provide for sightseeing, boating, fishing, and camping. There are also two

APPENDIX B

COST/BENEFIT ANALYSIS

The cost/benefit analysis presented here uses several separate but interrelated methods of evaluating the cost effectiveness of the plan. The following sections contain data that are useful in their own right and are also used in various cost/benefit analyses. No attempt has been made to artificially weight one view of cost-effectiveness as being more important than another or one visitor experience as being more valuable than another. The conclusions that follow are presented in their basic form; it is up to the reader's discretion to make any value judgements concerning the relative importance of various factors.

LEGISLATIVE INTENT

The act establishing Bighorn Canyon National Recreation Area requires the National Park Service to "provide for public outdoor recreation use . . . of the proposed Yellowtail Reservoir and lands adjacent thereto" and "preservation of the scenic, scientific and historic features contributing to public enjoyment of such lands and waters." All alternatives considered in the current planning effort, including the No Action alternative, comply with the guidelines set forth in the enabling legislation by providing land- and water-based recreational opportunities and preservation of the area's scenic, scientific, and historic resources.

MANAGEMENT OBJECTIVES

One measure of the effectiveness of a general management plan is how well its elements comply with management objectives. The management objectives from the approved "Statement for Management" for Bighorn Canyon National Recreation Area are presented below, with an evaluation of the alternatives relative to each objective.

Cooperation

To protect and enhance the area's recreational, natural, and cultural resources through cooperation in planning and management with the Crow Indian Tribe, Bureau of Reclamation, Forest Service, Bureau of Indian Affairs, Bureau of Land Management, and other Federal, State and local agencies.

The recreational and natural resources of Bighorn Canyon have been subject to cooperative planning with the Bureau of Reclamation (now Water and Power Resources Service), U.S. Forest Service, Bureau of Land Management, and applicable state agencies since the introduction of NPS management in the area. Cooperative research on the cultural resources in the region occurred in the early 1970s, and multiagency meetings were held in early 1979 as a result of the current planning effort. Crow reservation lands within Bighorn Canyon National Recreation Area are not included in this plan and will not be subject to NPS



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## Operating Criteria Comment

1 message

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Ken Grant <Keng.midway@yahoo.com>

Sun, Nov 30, 2014 at 7:13 PM

To: sha-mta-yoc@usbr.gov

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From Ken Grant (Keng.midway@yahoo.com) on Sunday, November 30, 2014 at 19:13:47

message: Thank you for this opportunity to comment on the operating criteria you have been using the last several years.

I feel the bureau has done an outstanding job managing the lake levels and releases. The operating criteria has worked well for all parties in dry years as well as extremely wet years.

I understand that extreme conditions cause unfavorable lake levels and releases at different times of the year. This is something we just need to live with.

I do worry about different parties attempting to pressure the Bureau into increasing releases at the detriment of lake levels. I hope the Bureau will continue to follow the successful operating criteria without changing it due to pressure from those more interested in the river flows than the lake levels.

Monitoring the inflows and projected inflows on a daily basis is so important to make sure the operating plan works correctly.

Just when we think things are on track, I hear rumors that the Bureau is being pressured and considering changing the criteria. I hope these are only rumors.

Comments at the last meeting by Doug Haake made it sound like he was comparing a river release of 2500cfs was equal to a lake level of 3617. This is not true at all.

The river is a world class fishery at 2500cfs. We can launch a boat at 3617 at Horseshoe Bend but we have an extremely shallow south lake that makes it impossible to have any south lake recreation. We can only launch and go into the canyon. 2500 cfs river release would be more comparable to 3630 lake elevation.

In the 70's the Bureau and NPS developed an MOU that states the NPS would determine optimal and minimum lake levels for public recreational use. I don't think there is a new MOU between the Bureau and MFWP that overrides the original MOU. This would lead me to believe that the Park Service's lake level recommendations would trump river release recommendations.

In the 80's and 90's the operations at the Bureau morphed into improper management of the water shed region. This resulted in a dry south lake for several years in the early 2000's which was blamed on drought years but we now know was poor management.

The Bureau is now on track and doing a great job. Please don't let history repeat itself.

address: 115 w 10th st

city: Lovell WY 82431

Submit: Send

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YOC, BOR MTA <sha-mta-yoc@usbr.gov>

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## Operating Criteria Comment

1 message

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**Kolt Bischoff** <kolt.bischoff@tctstaff.com>

Fri, Jan 16, 2015 at 8:58 AM

To: sha-mta-yoc@usbr.gov

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From Kolt Bischoff ([kolt.bischoff@tctstaff.com](mailto:kolt.bischoff@tctstaff.com)) on Friday, January 16, 2015 at 08:58:19

message: As an avid ice fisherman I would like discuss my concern for the lake possibly being drained. I live in Lovell and if you don't own a snowmobile there sre not a lot of activities in our area, unless u want to drive a minimum of an hour or two. On the weekends the ice is consistently filled with family's who enjoy this sport, not to mention in the summer when main street is filled with boats from Wyoming and Montana heading out to Big Horn Lake. Please don't take our lake away. Thank you.

address: 1204 RD 11

city: Lovell, WY 82431

Submit: [Send](#)

---



YOC, BOR MTA <sha-mta-yoc@usbr.gov>

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## Operating Criteria Comment

1 message

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Larry Slater <bighomengravingsign@yahoo.com>  
To: sha-mta-yoc@usbr.gov

Mon, Nov 24, 2014 at 11:21 AM

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From Larry Slater ([bighomengravingsign@yahoo.com](mailto:bighomengravingsign@yahoo.com)) on Monday, November 24, 2014 at 11:21:42

message: The Lovell area and the state of Wyoming were promised by the Federal government that by putting in the yellowtail dam and taking away tax revenue from land that the lake covered certain levels would be maintained in the lake for recreation. Until 8 years ago, the Federal government has not met that commitment and let the below dam river dominate the lake levels. It is time for the government to live up to their own promises about lake levels. Also, the sediment problem needs to be addressed. If it had been designed properly at the beginning, we would not have the sediment problem that we have, which is another problem of the Feds. The lake levels and the recreation opportunities have a major impact on the economy of Lovell and surrounding areas. This is a letter to ask for the feds to live up to their promises.

address: 320 w 7th

city: Lovell, WY 82431

Submit: Send

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YOC, BOR MTA <sha-mta-yoc@usbr.gov>

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## Operating Criteria Comment

1 message

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**Lesa Mayes** <lesamayes\_101@hotmail.com>

Fri, Jan 16, 2015 at 4:02 PM

To: sha-mta-yoc@usbr.gov

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From Lesa Mayes ([lesamayes\\_101@hotmail.com](mailto:lesamayes_101@hotmail.com)) on Friday, January 16, 2015 at 16:02:40

message: Our lake supports the most recreational and wildlife activities when lake levels are maintained as follows:

Winter minimum: 3620 feet

Memorial Day level: 3630

July to November level: 3640

It is also important that the silt issue at the south end of the lake be addressed.

address: 1113 Road 11 1/2

city: Lovell, WY 81431

Submit: Send

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YOC, BOR MTA <sha-mta-yoc@usbr.gov>

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## Operating Criteria Comment

1 message

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Marianne Grant <ani64a@yahoo.com>

Thu, Jan 15, 2015 at 2:29 PM

To: sha-mta-yoc@usbr.gov

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From Marianne Grant ([ani64a@yahoo.com](mailto:ani64a@yahoo.com)) on Thursday, January 15, 2015 at 14:29:21

message: Please maintain the lake levels of Bighorn lake. When the plan was originally proposed to the residents of north Big Horn County the deal was made. In the 1990's that deal was broken and finally in the early 2000's we got our water back. We use the lake to use our jet-skiis and boats. We actually had to sell them in the 90's and bought some more when the lake levels were brought back up. We enjoy playing on the lake. Please keep our Lake!

Thanks,  
Marianne Grant

address: 205 E. 2nd

city: Lovell, WY 82431

Submit: Send

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## Operating Criteria Comment

1 message

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Mark Garrison <info@hiddentreasurecharters.com>  
To: sha-mta-yoc@usbr.gov

Fri, Nov 28, 2014 at 10:23 AM

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From Mark Garrison ([info@hiddentreasurecharters.com](mailto:info@hiddentreasurecharters.com)) on Friday, November 28, 2014 at 10:23:06

message: We are the operators of Horseshoe Bend Marina and conduct the boat tours from Horseshoe Bend during Memorial Day to Labor Day. I have spent 9 years, coming now on the 10th year operating out of Horseshoe bend and steadily bringing more and more people by a broad based marketing campaign to introduce potential visitors to this Park. We have not only invested a great deal of money and time into developing this area as a user friendly area, we are committed to making it a success. It is impossible for us to operate with less than 3620 between Friday memorial day weekend and Labor Day. This impact may seem small to you and inconsequential, but the reality is, last year our first tour was June 23rd. We lost a month and this cannot continue. Management of the unit as well as fishery should be high on the list as well as this is a National Recreation Area. All interests have mostly worked together for the last 3 -4 years in obstinate harmony. The government's management criteria of this area should be maintained with consideration of the lake level issues which make it proper for all parties concerned. I am very concerned that a change in this policy will leave Horseshoe Bend a dry mud hole as it was in years past. A dramatic change at this point would lead me to believe that we are wasting our time operating here. Our business has increased dramatically over the past 9 years and the services we offer are increasing even with a decreasing budget and allocation of resources. This is because we believe in the place and what it has to offer. Our annual marketing budget is at least \$20,000 every year and has been so for the last 6 years. I urge you to consider this fact in your assessment of the operating plan. It is not what it is, but what it will be. We have largely been silent for the last nine years on these issues as it seems like a waste of time for comments as we are on the low end of the reservoir, however, in our opinion, second to flood control, our end should be the starting point of the analysis, not the end, to maintain the minimum lake levels. Thank you.

address: 515 Rd 2AB

city: Cody, Wy 82414

Submit: Send

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# **Montana Fish, Wildlife & Parks**

Region 5 Headquarters 2300 Lake Elmo Dr. Billings, MT, 59105 (406) 247-2940

Jan. 14, 2015

Bureau of Reclamation  
Montana Area Office  
River and Reservoir Operations  
2900 Fourth Avenue North  
Billings MT 59101

Montana Fish, Wildlife and Parks (FWP) appreciates the opportunity to provide comments and suggestions on the Bighorn River/ Lake operating criteria. We have made major strides in identifying the needs of all users on the Bighorn system, and in developing more transparent operating criteria to help direct water management in the system.

After several years of water management using these operating criteria we have identified a number of concerns that need to be addressed. In general, we believe these operating criteria are restrained by too many fixed points. They lack the flexibility to adjust to changing conditions during the water year. We recommend some minor changes to the operating criteria that we believe will improve their implementation. Most of our comments pertain to a perceived change in water management philosophy that the Bureau of Reclamation (BOR) seems to be using in applying these criteria.

When we compared recent water management with prior years, it became evident that river interests have taken a serious hit since the new operating criteria were implemented. Doug Haacke presented a very telling table with his comments comparing historic lake levels and river releases (1970-2006) with operations since 2006, when BOR began working with all user groups to ensure that everyone shares in the pain during low water years. Instead, as this table clearly shows, the new management direction has been geared towards filling and maintaining a full reservoir at all times with minimal regards for river fisheries flows, even during years of abundant water supplies.

Several apparent changes in management philosophies within the BOR have negatively impacted river interests since these new operating criteria were implemented. Some of these impacts can be corrected by minor adjustments in the operating criteria, but others will require an honest evaluation of the current management philosophies that are driving the data presented in Doug's table.

One of the biggest changes we see is how the BOR is treating Montana's preferred minimum fisheries flow of 2,500 cfs. We presented this flow request to the BOR in the early

1980s as the minimum flow needed to maintain a majority of the side channel habitat in the Bighorn River for fish production. We verified these flows with WETP flow analysis on several important side channels in the early 1990s. FWP has always been very consistent in asking for 2,500 cfs as a minimum flow whenever water was available. A flow of 2,000 cfs was suppose to be a minimum flow target during poor water conditions with an absolute minimum flow of 1,500 cfs during extreme drought conditions..

To clarify this point, FWP formally requests a change in terminology -- used under the Desired River Fishery Flows section on page 5 of the original operating criteria -- to the way we have been presenting our flow requests for almost 30 years: 2,500 cfs is the Minimum Target Fishery Flow, 2,000 cfs is the Drought Minimum Fishery Flow, and 1,500 cfs is the Absolute Minimum Fishery Flow. For more than 25 years the BOR did a very good job managing for a minimum river flow of 2,500 cfs while still providing requested recreational water levels in Bighorn Lake most of the time. In recent years, the BOR has abandoned this 2,500 cfs flow request. The agency seems to be managing around a flow of 2,000 cfs with 2,500 cfs being a target that it might (but not necessarily) be provided during ideal water conditions. This is very evident in Doug's table where average monthly river flows for 26 years between 1970 and 2006 never dropped below 2,500 cfs whereas, since 2006, it is the norm to have average monthly river flows below 2,500 cfs except in the high runoff months when all the stored water must be evacuated to provide flood storage.

Another management philosophy change that has negatively impacted river interests is the idea that Bighorn Lake has to be filled and then held as close to full pool as possible throughout the summer and fall. In the past, the BOR managed the system to fill the reservoir in late June or early July, then used the stored water in the reservoir to help maintain river levels at or above 2,500 cfs during the critical rearing period for both rainbows and brown trout. The reservoir was managed to maintain water levels above 3,635 feet elevation through mid-October, and 3,630 feet by the end of November.

With this operational plan, the BOR used the upper 10 feet of storage in the reservoir to help maintain minimum fisheries flows in the river while still maintaining full recreational use on the reservoir. In recent years, the BOR has used potential river releases to make sure the reservoir stays full late into the fall, providing minimal river releases through the winter, and then evacuating large amounts of stored water during the spring runoff months (see Doug's table). This overly conservative reservoir management not only hurts river flows, but it also minimizes flood storage capacity in Bighorn Lake during the fall when most of the major rain events have historically occurred in the basin. The major rain event that hit north central Montana during fall 2014, and caused a three-foot rise in Fort Peck Reservoir, occurred when Bighorn Lake was still a foot into the flood pool. If that storm had been centered a couple hundred miles further south, Bighorn Lake would not have been able to manage the inflow without major damage downstream.

Fairly early in the working group process, Mark Fowden with Wyoming Game and Fish called a meeting in an effort to improve working relationships between fisheries crews in Montana and Wyoming. One of the main outcomes of this meeting was that both states put together some ideas of what they thought they needed from a fisheries standpoint, in managing

water on the Bighorn Lake/River system. The ideas presented by Mark Smith of Wyoming Game and Fish and Ken Frazer of Montana FWP are included with these comments.

Some general thoughts on the developing these recommendations for the Bighorn River fishery include:

- Spawning normally has not been a limiting factor on the Bighorn River. But when water levels are too low to provide rearing habitat in the side channels recruiting small trout into the population suffers.
- Rainbows normally have done better than brown trout during low-flow years with some of the strongest year classes of rainbow coming from low-flow years. When water is short, FWP would rather give up flows during the spring rainbow spawn to raise reservoir levels in hopes that more stored water would be available to provide better rainbow and brown trout rearing conditions and brown trout spawning flows later in the season.

The conditions developed for the Bighorn River were given to Tim Felchle to model and see if they were reasonable. Amazingly, in all conditions except extreme drought, it was possible to maintain river flows at or above 2,500 cfs, at least during the critical rearing period. During good water conditions it should be possible to maintain river flows at or above 2,500 cfs most of the year. Even though the reservoir levels used in this modeling exercise were lower than targeted by the current operating criteria, elevations achieved or exceeded 3,617 feet by Memorial Day in almost every case. Copies of this modeling exercise are included.

The Bighorn River flows during recent years have been in direct conflict with the fisheries criteria listed above. By setting the end-of-March target elevation at 3,617, it almost guarantees that, under normal or high inflow conditions, river flows have to be increased significantly just as the rainbows are starting to spawn. Recent efforts to micro-manage reservoir levels have resulted in continually changing flow levels during the spawning period, which disrupts spawning. Once runoff declines, dam discharges are immediately dropped during the critical rearing period to ensure the reservoir stays completely full into the fall. This has caused the reservoir level to enter the flood pool. With the tighter control by the Corps of Engineers (COE) since 2011, once the reservoir is in the flood pool the BOR goes into another period of micro-management which results in continually changing river stage every time there is a change in weather conditions. Fluctuating river flows negatively impact the fisheries and anglers on the river. This was especially evident this past summer.

Our recommendations below include minor adjustments to the current operational criteria that should improve water management in the Bighorn system. They also include some recommendations that will require reevaluation of current management philosophies that drive the way water is currently managed on the Bighorn.

First, we request that, except during very dry conditions, the BOR consider 2,500 cfs (or a comparable stage level) to be the minimum target flow that should be maintained in the river, at least for the trout rearing period from early July until fall/winter flows are established. One way to help accomplish this would be to reduce the end-of-March target from the current target

elevation of 3617. A lower target would mean slightly higher flows during the winter, which would benefit not only the river fishery, but would provide more power production for WAPA during the cold winter months. Slightly lower reservoir elevations, and increased storage capacity in the spring during wet years will reduce the need for steep reservoir drawdowns, like occurred in 2014, and reduce the time the Horseshoe Bend boat ramp is without water. At the same time, it would reduce the volume of water that has to be evacuated, causing high flow during the spring rainbow spawn. Based on the attached model that Tim ran for us in 2008, even with a lower reservoir drawdown and lower end-of-March lake levels, he was able to provide 2,500 cfs flows during critical periods, provide recreational flows for the reservoir, and fill or come very close to filling the reservoir, even during marginal water conditions.

More effort should be put into managing river levels based on stage during the critical summer months. The 2,500 cfs flow requested is based on providing a minimum water level in key side channels during the critical rearing period. As vegetation grows in the river it takes less water to maintain these same water levels in the side channels. During most years managing the Bighorn for stage during the critical summer rearing period should provide extra water that would be available to maintain or increase reservoir levels as needed, while maintaining the river fishery.

More flexibility should be allowed in dealing with established winter releases. Since the operating criteria were implemented, it appears the calculated winter gains into Bighorn Lake have been routinely underestimated, resulting in higher than predicted reservoir levels during the winter. This extra water should be used during the winter to benefit power production for WAPA, and to make sure spring reservoir levels do not exceed targeted levels, leading to higher releases during the rainbow spawn.

There also should be more flexibility when snowpack levels start to vary from normal. When winter snowpack is high, river releases should be increased earlier than March to reduce high spring releases, and benefit power production. If conditions turn dry, releases should be reduced earlier in the spring to fill the reservoir faster and hopefully provide water to help maintain minimum flows (stage) during the critical summer rearing period. In the past, winter flows were set at the start of brown trout spawning, and then minor adjustments were discussed on a regular basis with the BOR water managers. This communication has now been replaced with the monthly stakeholder's calls, which do not promote the close coordination seen in the past. Reestablishing better communication with the BOR would help overcome many of the issues raised above.

There should be more flexibility built into filling and maintaining a full reservoir. Target fill levels for Bighorn Lake should be adjusted down slightly to between 3,636 and 3,638 feet depending on projected inflows. Most years that target refilling to elevation 3,640, cause reservoir levels to rise into the exclusive flood pool. Raising reservoir levels very far into the flood pool seriously impacts reservoir recreation on most of Bighorn Lake by flooding shoreline facilities and clogging the water with floating debris, which limits boating use.

Also, the tighter control that the Corps of Engineers has placed on use of the exclusive flood pool since 2011, can lead to micro-management of water levels like we experienced in the summer of 2014, which can seriously impact angler use on the river. Setting a target elevation

that is two to four feet below the bottom of the exclusive flood pool means that, when the BOR exceeds this target, they will be filling the reservoir rather than going into the flood pool. This minor adjustment would reserve the flood pool for managing higher-than-average inflows during wet years or high precipitation events.

Once these targeted fill elevations are reached, except during extremely dry conditions, the BOR should plan to use some of this stored water to maintain a minimum flow of 2,500 cfs in the river through the critical summer rearing period. A gradual draw down to below 3,640 feet throughout the summer will not impact recreational use on the reservoir, but will provide significant benefits to the river fishery downstream. This operational pattern also will provide more power production during the summer air-conditioner season, and provide more flood storage to better manage late summer or fall precipitation events.

Thank you for the opportunity to provide comments into the continually improving water management in the Bighorn system. We hope our input provides some constructive ideas that can improve implementation of the operational criteria that have been developed over the past several years. We feel a few minor changes in how a given volume of water is managed throughout the year can provide major benefits to the important Bighorn River fishery without negatively impacting, and often benefiting, other stakeholders in the system.

Sincerely,

Gary Hammond, regional supervisor  
Montana Fish, Wildlife and Parks  
2300 Lake Elmo Drive  
Billings, MT 59105

## **Bighorn River Flow needs presented by MT FWP, 2008**

### **I. Good Conditions** – Snowpack $\geq$ 90%, Reservoir levels $\geq$ 3610 by the end of February.

Maintain river flows  $\geq$  2,500 cfs through entire year with some kind of spring rise to help flush accumulated sediment in the upper river.

These flows should maintain a good fishery on the Bighorn River for both rainbows and brown trout, and should provide enough flow to spread anglers out along the river.

### **II. Fair Conditions** – Snowpack 75% to 90%, Reservoir levels $\geq$ 3600 by the end of March.

Maintain river flows  $\geq$  2,000 cfs through the year if possible. If necessary drop flows below 2,000 cfs from March through early July to help fill the reservoir, then come back up to 2,000 cfs during the summer and fall for rearing and brown trout spawning.

These flows should maintain a reasonable trout fishery on the river with limited angler crowding. Crowding would be worse in the spring if flows drop below 2,000 cfs.

### **III. Poor Conditions** – Snowpack < 75% or Reservoir < 3600 by the end of February.

Maintain river flows  $\geq$  1,500 cfs from March through mid-July then increase flow to as close to 2,000 cfs as possible for the remainder of the year for rearing and brown trout spawning.

These flows will result in a declining to poor fishery, and serious angler crowding on the Bighorn River during the busy spring and early summer fishery.

### **IV. Extreme drought** –

Maintain river flows  $\geq$  1,500 cfs. If any extra water is available, increase flows from mid-July on to provide improved rearing habitat once the young trout are out of the gravel.

These flows will result in a poor and declining fishery, will cause accumulating silt over spawning and food-producing gravel in the upper river, and will produce serious crowding problems for anglers still using the river.

**Reservoir fisheries needs presented by WY G&F, 2008**

	May 15 –Sept 15
Poor/no WY Reservoir Fishery	
Reasonable WY Reservoir Fishery	<p>Reservoir <math>\geq 3,620'</math>  May15 rising to <math>\geq 3,630'</math> during period and <math>\geq 3,620'</math> on Sept 15.</p> <p>Reservoir remains <math>\geq 3615'</math> during ice covered period (Dec 15- Mar 15).</p>
Good WY Reservoir Fishery	<p>Reservoir <math>\geq 3,630'</math>  May15 rising to <math>\geq 3,640'</math> during period and <math>\geq 3,630'</math> on Sept 15.</p> <p>Reservoir remains <math>\geq 3620'</math> during ice covered period (Dec 15- Mar 15).</p>

# RECLAMATION

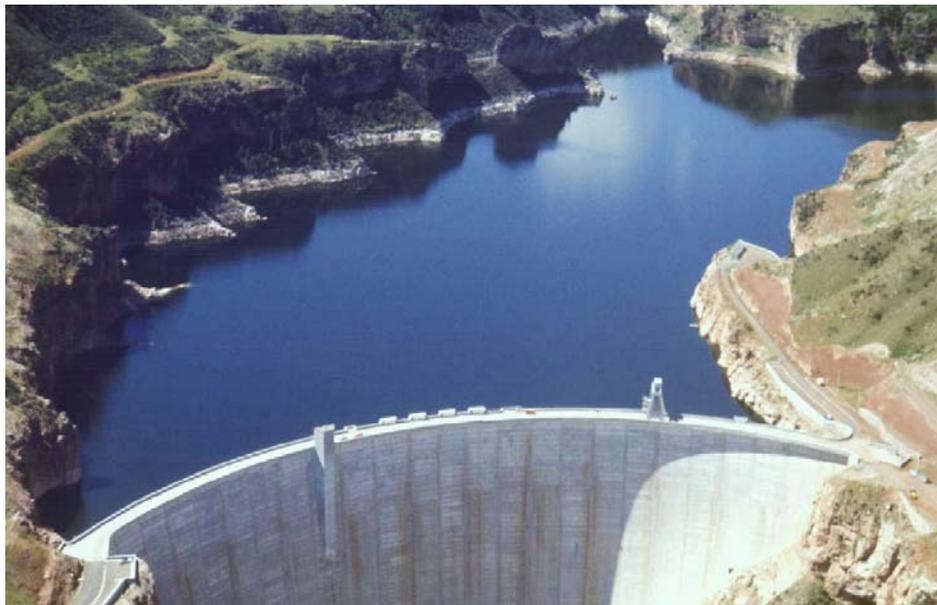
## *Managing Water in the West*

February 12, 2008

Ken,

Attached are 8 different monthly operation scenarios that were prepared under various runoff conditions as suggested by Montana Fish, Wildlife and Parks. In addition to the suggestions, 2 more plans were prepared to show operation scenarios based on inflows expected to be about 60 percent of average. In some of the plans, the end of month storage in Bighorn Lake at the end of February was varied, due to assumptions of previous runoff conditions that may have been experienced. The April-July inflows that were modeled in each of the operation scenarios were estimated to approximately equal the snowpack conditions that were identified. Monthly inflows throughout the remainder of the year were distributed based on historical records of the April-July inflows. If you have any questions, please feel free to call me at (406) 247-7318.

Tim H. Felchle  
Reservoir and River Operations



U. S. Department of the Interior  
Bureau of Reclamation  
Montana Area Office  
River and Reservoir Operations

BHXAOP V1.12 Run: 12-Feb-2008 11:45 (MFWP Option I a.)  
 Based on Most Probable Inflow Forecast  
 April-July Inflow = 1,001.9 kaf (93% of 30-yr or 85% of P.O.R.)  
 Annual Inflow = 2,244.8 kaf (105% of 30-yr or 95% of P.O.R.)

Bighorn Reservoir		Initial Cont 803.2 kaf 3610.00 ft				Maximum Cont 1328.4 kaf Elev 3657.00 ft				Minimum Cont 493.6 kaf Elev 3547.00 ft				Total
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Boysen Release	kaf	24.6	44.6	67.6	69.9	76.9	69.2	59.5	57.1	55.2	57.1	57.1	23.0	661.8
Boysen Release	cfs	400	750	1099	1175	1251	1125	1000	929	928	929	929	414	
Buffalo Bill Riv Flo	kaf	9.2	58.9	108.7	125.9	123.8	77.5	75.0	24.9	20.8	21.5	21.5	8.6	676.3
Buffalo Bill Riv Flo	cfs	150	990	1768	2116	2013	1260	1260	405	350	350	350	155	
Station Gain	kaf	68.9	62.1	68.3	169.2	26.0	11.6	53.4	112.8	86.0	64.9	69.2	114.3	906.7
Monthly Inflow	kaf	102.7	165.6	244.6	365.0	226.7	158.3	187.9	194.8	162.0	143.5	147.8	145.9	2244.8
Monthly Inflow	cfs	1670	2783	3978	6134	3687	2575	3158	3168	2723	2334	2404	2627	
Turbine Release	kaf	149.4	145.2	160.5	156.0	226.7	206.0	192.1	153.5	179.3	185.3	185.2	167.3	2106.5
2008 Bypass/Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Release	kaf	149.4	145.2	160.5	156.0	226.7	206.0	192.1	153.5	179.3	185.3	185.2	167.3	2106.5
Total Release	cfs	2430	2440	2610	2622	3687	3350	3228	2496	3013	3014	3012	3012	
Spring Flow	kaf	4.3	4.2	4.3	4.2	4.3	4.3	4.2	4.3	4.2	4.3	4.3	3.9	50.8
Irrigation Reqmnt	kaf	0.0	0.6	11.1	10.0	27.7	26.8	18.8	4.1	0.0	0.0	0.0	0.0	99.1
Afterbay Rels	kaf	153.7	149.4	164.8	160.2	231.0	210.3	196.3	157.8	183.5	189.6	189.5	171.2	2157.3
Afterbay Rels	cfs	2500	2511	2680	2692	3757	3420	3299	2566	3084	3084	3082	3083	
BIGHORN LAKE MONTHLY OPERATIONS	kaf	148.8	148.8	153.7	150.2	203.3	183.5	177.5	153.7	183.5	189.6	189.5	171.2	2058.2
River Release	cfs	2500	2501	2500	2524	3306	2984	2983	2500	3084	3084	3082	3083	
Min Release	kaf	153.7	148.8	153.7	148.8	153.7	153.7	148.8	153.7	148.8	153.7	153.7	138.8	1809.9
End-Month Targets	kaf				1070.0	1070.0								
End-Month Content	kaf	756.5	776.9	861.0	1070.0	1070.0	1022.3	1018.1	1059.4	1042.1	1000.3	962.9	941.5	
End-Month Elevation	ft	3602.14	3605.68	3618.34	3640.00	3640.00	3636.01	3635.63	3639.15	3637.71	3634.01	3630.35	3628.08	
Net Change Content	kaf	-46.7	20.4	84.1	209.0	0.0	-47.7	-4.2	41.3	-17.3	-41.8	-37.4	-21.4	138.3
Yellowtail Power	2008	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Total
Turbine Release	kaf	149.4	145.2	160.5	156.0	226.7	206.0	192.1	153.5	179.3	185.3	185.2	167.3	2106.5
Generation	gwh	55.490	53.644	60.531	61.942	92.953	83.872	77.601	62.359	73.102	74.877	73.917	66.141	836.429
End-Month Power Cap	mw	252.0	255.1	266.7	287.5	287.5	283.5	283.1	286.7	285.2	281.5	278.0	275.8	
% Max Gen		26	26	28	30	43	39	37	29	35	35	34	34	
Ave kwh/af		371	369	377	397	410	407	404	406	408	404	399	395	397
Upstream Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Generation	gwh	55.490	53.644	60.531	61.942	92.953	83.872	77.601	62.359	73.102	74.877	73.917	66.141	836.429

Comments: Beginning with storage at elevation 3610 and April-July inflows at 85% of average, it appears releases can be maintained above 2,500 cfs all year and still maintain the reservoir level above 3635 through September.

BHXAOP V1.12 Run: 12-Feb-2008 11:46 (MFWP Option I b.)  
 Based on Most Probable Inflow Forecast  
 April-July Inflow = 1,001.9 kaf (93% of 30-yr or 85% of P.O.R.)  
 Annual Inflow = 2,244.8 kaf (105% of 30-yr or 95% of P.O.R.)

Bighorn Reservoir		Initial Cont 803.2 kaf 3610.00 ft				Maximum Cont 1328.4 kaf Elev 3657.00 ft				Minimum Cont 493.6 kaf Elev 3547.00 ft				Total
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Boysen Release	kaf	24.6	44.6	67.6	69.9	76.9	69.2	59.5	57.1	55.2	57.1	57.1	23.0	661.8
Boysen Release	cfs	400	750	1099	1175	1251	1125	1000	929	928	929	929	414	
Buffalo Bill Riv Flo	kaf	9.2	58.9	108.7	125.9	123.8	77.5	75.0	24.9	20.8	21.5	21.5	8.6	676.3
Buffalo Bill Riv Flo	cfs	150	990	1768	2116	2013	1260	1260	405	350	350	350	155	
Station Gain	kaf	68.9	62.1	68.3	169.2	26.0	11.6	53.4	112.8	86.0	64.9	69.2	114.3	906.7
Monthly Inflow	kaf	102.7	165.6	244.6	365.0	226.7	158.3	187.9	194.8	162.0	143.5	147.8	145.9	2244.8
Monthly Inflow	cfs	1670	2783	3978	6134	3687	2575	3158	3168	2723	2334	2404	2627	
Turbine Release	kaf	112.5	127.3	160.5	210.8	226.7	206.0	192.1	153.5	179.3	185.3	185.2	167.3	2106.5
Bypass/Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Release	kaf	112.5	127.3	160.5	210.8	226.7	206.0	192.1	153.5	179.3	185.3	185.2	167.3	2106.5
Total Release	cfs	1830	2139	2610	3543	3687	3350	3228	2496	3013	3014	3012	3012	
Spring Flow	kaf	4.3	4.2	4.3	4.2	4.3	4.3	4.2	4.3	4.2	4.3	4.3	3.9	50.8
Irrigation Reqmnt	kaf	0.0	0.6	11.1	10.0	27.7	26.8	18.8	4.1	0.0	0.0	0.0	0.0	99.1
Afterbay Rels	kaf	116.8	131.5	164.8	215.0	231.0	210.3	196.3	157.8	183.5	189.6	189.5	171.2	2157.3
Afterbay Rels	cfs	1900	2210	2680	3613	3757	3420	3299	2566	3084	3084	3082	3083	
BIGHORN LAKE MONTHLY OPERATIONS	kaf	130.9	130.9	153.7	205.0	203.3	183.5	177.5	153.7	183.5	189.6	189.5	171.2	2058.2
River Release	cfs	1900	2200	2500	3445	3306	2984	2983	2500	3084	3084	3082	3083	
Min Release	kaf	116.8	130.9	153.7	148.8	153.7	153.7	148.8	153.7	148.8	153.7	153.7	138.8	1755.1
End-Month Targets	kaf				1070.0	1070.0								
End-Month Content	kaf	793.4	831.7	915.8	1070.0	1070.0	1022.3	1018.1	1059.4	1042.1	1000.3	962.9	941.5	
End-Month Elevation	ft	3608.42	3614.29	3625.19	3640.00	3640.00	3636.01	3635.63	3639.15	3637.71	3634.01	3630.35	3628.08	
Net Change Content	kaf	-9.8	38.3	84.1	154.2	0.0	-47.7	-4.2	41.3	-17.3	-41.8	-37.4	-21.4	138.3
Yellowtail Power	2008	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Total
Turbine Release	kaf	112.5	127.3	160.5	210.8	226.7	206.0	192.1	153.5	179.3	185.3	185.2	167.3	2106.5
Generation	gwh	42.091	47.892	61.769	84.436	92.953	83.872	77.601	62.359	73.102	74.877	73.917	66.141	841.010
End-Month Power Cap	mw	257.6	262.9	273.1	287.5	287.5	283.5	283.1	286.7	285.2	281.5	278.0	275.8	
% Max Gen		20	23	29	41	43	39	37	29	35	35	34	34	
Ave kwh/af		374	376	385	401	410	407	404	406	408	404	399	395	399
Upstream Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Generation	gwh	42.091	47.892	61.769	84.436	92.953	83.872	77.601	62.359	73.102	74.877	73.917	66.141	841.010

Comments: Beginning with storage at elevation 3610 and April-July inflows at 85% of average. So different from Option I a., releases in March and April were reduced and maintained lower than 2,500 cfs to prevent the reservoir level from dropping lower than elevation 3608 and then increase releases later in the spring to control storage from exceeding elevation 3640. River releases were maintained above 2,500 cfs through the remainder of the year and the reservoir level was maintained above elevation 3635 through September.

BHXAOP V1.12 Run: 12-Feb-2008 12:00 (MFWP Option II a.)  
 Based on Most Probable Inflow Forecast  
 April-July Inflow = 918.5 kaf (85% of 30-yr or 78% of P.O.R.)  
 Annual Inflow = 2,090.6 kaf (98% of 30-yr or 88% of P.O.R.)

Bighorn Reservoir		Initial Cont 803.2 kaf 3610.00 ft				Maximum Cont 1328.4 kaf Elev 3657.00 ft				Minimum Cont 493.6 kaf Elev 3547.00 ft				Total
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Boysen Release	kaf	24.6	44.6	67.6	69.9	76.9	69.2	59.5	57.1	55.2	57.1	57.1	23.0	661.8
Boysen Release	cfs	400	750	1099	1175	1251	1125	1000	929	928	929	929	414	
Buffalo Bill Riv Flo	kaf	9.2	58.9	108.7	125.9	123.8	77.5	75.0	24.9	20.8	21.5	21.5	8.6	676.3
Buffalo Bill Riv Flo	cfs	150	990	1768	2116	2013	1260	1260	405	350	350	350	155	
Station Gain	kaf	68.9	51.6	53.8	133.8	3.0	-0.4	42.0	101.8	75.2	53.9	63.1	105.8	752.5
Monthly Inflow	kaf	102.7	155.1	230.1	329.6	203.7	146.3	176.5	183.8	151.2	132.5	141.7	137.4	2090.6
Monthly Inflow	cfs	1670	2607	3742	5539	3313	2379	2966	2989	2541	2155	2305	2474	
Turbine Release	kaf	118.7	127.3	160.5	154.6	193.3	188.6	175.4	153.5	172.0	177.7	177.7	160.5	1959.8
Bypass/Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Release	kaf	118.7	127.3	160.5	154.6	193.3	188.6	175.4	153.5	172.0	177.7	177.7	160.5	1959.8
Total Release	cfs	1930	2139	2610	2598	3144	3067	2948	2496	2891	2890	2890	2890	
Spring Flow	kaf	4.3	4.2	4.3	4.2	4.3	4.3	4.2	4.3	4.2	4.3	4.3	3.9	50.8
Irrigation Reqmnt	kaf	0.0	0.6	11.1	10.0	27.7	26.8	18.8	4.1	0.0	0.0	0.0	0.0	99.1
Afterbay Rels	kaf	123.0	131.5	164.8	158.8	197.6	192.9	179.6	157.8	176.2	182.0	182.0	164.4	2010.6
Afterbay Rels	cfs	2000	2210	2680	2669	3214	3137	3018	2566	2961	2960	2960	2960	
BIGHORN LAKE MONTHLY OPERATIONS	kaf	130.9	130.9	153.7	148.8	169.9	166.1	160.8	153.7	176.2	182.0	182.0	164.4	1911.5
River Release	cfs	2000	2200	2500	2501	2763	2701	2702	2500	2961	2960	2960	2960	
Min Release	kaf	123.0	130.9	153.7	148.8	153.7	153.7	148.8	153.7	148.8	153.7	153.7	138.8	1761.3
End-Month Targets	kaf				1070.0	1070.0								
End-Month Content	kaf	787.2	815.0	884.6	1059.6	1070.0	1027.7	1028.8	1059.1	1038.3	993.1	957.1	934.0	
End-Month Elevation	ft	3607.41	3611.82	3621.41	3639.16	3640.00	3636.48	3636.58	3639.12	3637.39	3633.33	3629.75	3627.26	
Net Change Content	kaf	-16.0	27.8	69.6	175.0	10.4	-42.3	1.1	30.3	-20.8	-45.2	-36.0	-23.1	130.8
Yellowtail Power	2008	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Total
Turbine Release	kaf	118.7	127.3	160.5	154.6	193.3	188.6	175.4	153.5	172.0	177.7	177.7	160.5	1959.8
Generation	gwh	44.357	47.680	61.235	61.517	79.138	76.850	71.029	62.456	70.083	71.685	70.776	63.314	780.120
End-Month Power Cap	mw	256.7	260.7	269.5	286.7	287.5	284.0	284.1	286.6	284.9	280.9	277.4	275.0	
% Max Gen		21	23	29	30	37	36	34	29	34	33	33	33	
Ave kwh/af		374	375	382	398	409	407	405	407	407	403	398	394	398
Upstream Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Generation	gwh	44.357	47.680	61.235	61.517	79.138	76.850	71.029	62.456	70.083	71.685	70.776	63.314	780.120

Comments: Beginning with storage at elevation 3610 and April-July inflows reduced to 78% of average. River releases in March and April were reduced and maintained lower than 2,500 cfs to prevent the reservoir level from dropping lower than elevation 3607 and then increase releases later in the spring to control storage from exceeding elevation 3640. River releases were maintained above 2,500 cfs through the remainder of the year and the reservoir level was maintained above elevation 3636 through September.

BHXAOP V1.12 Run: 12-Feb-2008 12:05 (MFWP Option II b.)  
 Based on Most Probable Inflow Forecast  
 April-July Inflow = 918.5 kaf (85% of 30-yr or 78% of P.O.R.)  
 Annual Inflow = 2,090.6 kaf (98% of 30-yr or 88% of P.O.R.)

Bighorn Reservoir		Initial Cont 744.6 kaf 3600.00 ft				Maximum Cont 1328.4 kaf Elev 3657.00 ft				Minimum Cont 493.6 kaf Elev 3547.00 ft				Total
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Boysen Release	kaf	24.6	44.6	67.6	69.9	76.9	69.2	59.5	57.1	55.2	57.1	57.1	23.0	661.8
Boysen Release	cfs	400	750	1099	1175	1251	1125	1000	929	928	929	929	414	
Buffalo Bill Riv Flo	kaf	9.2	58.9	108.7	125.9	123.8	77.5	75.0	24.9	20.8	21.5	21.5	8.6	676.3
Buffalo Bill Riv Flo	cfs	150	990	1768	2116	2013	1260	1260	405	350	350	350	155	
Station Gain	kaf	68.9	51.6	53.8	133.8	3.0	-0.4	42.0	101.8	75.2	53.9	63.1	105.8	752.5
Monthly Inflow	kaf	102.7	155.1	230.1	329.6	203.7	146.3	176.5	183.8	151.2	132.5	141.7	137.4	2090.6
Monthly Inflow	cfs	1670	2607	3742	5539	3313	2379	2966	2989	2541	2155	2305	2474	
Turbine Release	kaf	118.7	115.4	129.8	154.6	177.3	188.6	175.4	153.5	172.0	177.7	177.7	160.5	1901.2
Bypass/Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Release	kaf	118.7	115.4	129.8	154.6	177.3	188.6	175.4	153.5	172.0	177.7	177.7	160.5	1901.2
Total Release	cfs	1930	1939	2111	2598	2884	3067	2948	2496	2891	2890	2890	2890	
Spring Flow	kaf	4.3	4.2	4.3	4.2	4.3	4.3	4.2	4.3	4.2	4.3	4.3	3.9	50.8
Irrigation Reqmnt	kaf	0.0	0.6	11.1	10.0	27.7	26.8	18.8	4.1	0.0	0.0	0.0	0.0	99.1
Afterbay Rels	kaf	123.0	119.6	134.1	158.8	181.6	192.9	179.6	157.8	176.2	182.0	182.0	164.4	1952.0
Afterbay Rels	cfs	2000	2010	2181	2669	2953	3137	3018	2566	2961	2960	2960	2960	
BIGHORN LAKE MONTHLY OPERATIONS	kaf	2000	119.0	123.0	148.8	153.9	166.1	160.8	153.7	176.2	182.0	182.0	164.4	1852.9
River Release	cfs	2000	2000	2000	2501	2503	2701	2702	2500	2961	2960	2960	2960	
Min Release	kaf	123.0	119.0	123.0	148.8	153.7	153.7	148.8	153.7	148.8	153.7	153.7	138.8	1718.7
End-Month Targets	kaf				1070.0	1070.0								
End-Month Content	kaf	728.6	768.3	868.6	1043.6	1070.0	1027.7	1028.8	1059.1	1038.3	993.1	957.1	934.0	
End-Month Elevation	ft	3597.07	3604.21	3619.35	3637.84	3640.00	3636.48	3636.58	3639.12	3637.39	3633.33	3629.75	3627.26	
Net Change Content	kaf	-16.0	39.7	100.3	175.0	26.4	-42.3	1.1	30.3	-20.8	-45.2	-36.0	-23.1	189.4
Yellowtail Power	2008	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Total
Turbine Release	kaf	118.7	115.4	129.8	154.6	177.3	188.6	175.4	153.5	172.0	177.7	177.7	160.5	1901.2
Generation	gwh	43.308	42.314	48.944	61.198	72.416	76.850	71.029	62.456	70.083	71.685	70.776	63.314	754.373
End-Month Power Cap	mw	247.3	253.8	267.6	285.3	287.5	284.0	284.1	286.6	284.9	280.9	277.4	275.0	
% Max Gen		20	20	23	30	34	36	34	29	34	33	33	33	
Ave kwh/af		365	367	377	396	408	407	405	407	407	403	398	394	397
Upstream Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Generation	gwh	43.308	42.314	48.944	61.198	72.416	76.850	71.029	62.456	70.083	71.685	70.776	63.314	754.373

Comments: A starting reservoir storage level was decreased to elevation 3600 and April-July inflows were 78% of average. River releases were reduced and maintained at 2,000 cfs during March through May and then increased to 2,500 cfs during June and July to control storage and prevent the reservoir level from exceeding elevation 3640. River releases were maintained above 2,500 cfs through the remainder of the year and the reservoir level was maintained above elevation 3636 through September.

BHXAOP V1.12 Run: 12-Feb-2008 13:22 (MFWP Options III)  
 Based on Most Probable Inflow Forecast  
 April-July Inflow = 835.0 kaf (77% of 30-yr or 71% of P.O.R.)  
 Annual Inflow = 1,936.4 kaf (91% of 30-yr or 82% of P.O.R.)

Bighorn Reservoir		Initial Cont 744.6 kaf 3600.00 ft				Maximum Cont 1328.4 kaf Elev 3657.00 ft				Minimum Cont 493.6 kaf Elev 3547.00 ft				Total
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Boysen Release	kaf	24.6	44.6	67.6	69.9	76.9	69.2	59.5	57.1	55.2	57.1	57.1	23.0	661.8
Boysen Release	cfs	400	750	1099	1175	1251	1125	1000	929	928	929	929	414	
Buffalo Bill Riv Flo	kaf	9.2	58.9	108.7	125.9	123.8	77.5	75.0	24.9	20.8	21.5	21.5	8.6	676.3
Buffalo Bill Riv Flo	cfs	150	990	1768	2116	2013	1260	1260	405	350	350	350	155	
Station Gain	kaf	68.9	41.0	39.3	98.4	-20.0	-12.4	30.6	90.9	64.4	42.9	57.0	97.3	598.3
Monthly Inflow	kaf	102.7	144.5	215.6	294.2	180.7	134.3	165.1	172.9	140.4	121.5	135.6	128.9	1936.4
Monthly Inflow	cfs	1670	2428	3506	4944	2939	2184	2775	2812	2360	1976	2205	2321	
Turbine Release	kaf	87.9	85.7	99.0	159.0	180.7	180.0	167.1	135.1	164.9	170.5	170.5	153.9	1754.3
Bypass/Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Release	kaf	87.9	85.7	99.0	159.0	180.7	180.0	167.1	135.1	164.9	170.5	170.5	153.9	1754.3
Total Release	cfs	1430	1440	1610	2672	2939	2927	2808	2197	2771	2773	2773	2771	
Spring Flow	kaf	4.3	4.2	4.3	4.2	4.3	4.3	4.2	4.3	4.2	4.3	4.3	3.9	50.8
Irrigation Reqmnt	kaf	0.0	0.6	11.1	10.0	27.7	26.8	18.8	4.1	0.0	0.0	0.0	0.0	99.1
Afterbay Rels	kaf	92.2	89.9	103.3	163.2	185.0	184.3	171.3	139.4	169.1	174.8	174.8	157.8	1805.1
Afterbay Rels	cfs	1499	1511	1680	2743	3009	2997	2879	2267	2842	2843	2843	2841	
BIGHORN LAKE MONTHLY OPERATIONS	kaf	89.3	89.3	92.2	153.2	157.3	157.5	152.5	135.3	169.1	174.8	174.8	157.8	1706.0
River Release	cfs	1499	1501	1499	2575	2558	2561	2563	2200	2842	2843	2843	2841	
Min Release	kaf	92.2	89.3	92.2	89.3	107.6	123.0	119.0	135.3	119.0	123.0	123.0	111.1	1324.0
End-Month Targets	kaf				1070.0	1070.0								
End-Month Content	kaf	759.4	818.2	934.8	1070.0	1070.0	1024.3	1022.3	1060.1	1035.6	986.6	951.7	926.7	
End-Month Elevation	ft	3602.65	3612.31	3627.35	3640.00	3640.00	3636.18	3636.01	3639.20	3637.16	3632.71	3629.18	3626.44	
Net Change Content	kaf	14.8	58.8	116.6	135.2	0.0	-45.7	-2.0	37.8	-24.5	-49.0	-34.9	-25.0	182.1
Yellowtail Power	2008	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Total
Turbine Release	kaf	87.9	85.7	99.0	159.0	180.7	180.0	167.1	135.1	164.9	170.5	170.5	153.9	1754.3
Generation	gwh	32.278	31.944	38.138	63.877	74.092	73.308	67.566	54.924	67.173	68.683	67.779	60.582	700.344
End-Month Power Cap	mw	252.4	261.1	275.1	287.5	287.5	283.7	283.5	286.7	284.7	280.3	276.8	274.2	
% Max Gen		15	15	18	31	35	34	33	26	32	32	32	31	
Ave kwh/af		367	373	385	402	410	407	404	407	407	403	398	394	399
Upstream Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Generation	gwh	32.278	31.944	38.138	63.877	74.092	73.308	67.566	54.924	67.173	68.683	67.779	60.582	700.344

Comments: A starting reservoir storage level was decreased to elevation 3600 and April-July inflows were 71% of average. River releases were reduced and maintained at 1,500 cfs during March through May and then increased to above 2,500 cfs during June and July to control storage and prevent the reservoir level from exceeding elevation 3640. River releases were maintained above 2,500 cfs through the remainder of the year and the reservoir level was maintained above elevation 3636 through September.

BHXAOP V1.12 Run: 12-Feb-2008 13:32 (MFWP Option IV a.)  
 Based on Most Probable Inflow Forecast  
 April-July Inflow = 392.0 kaf (36% of 30-yr or 33% of P.O.R.)  
 Annual Inflow = 934.3 kaf (44% of 30-yr or 39% of P.O.R.)

Bighorn Reservoir		Initial Cont 744.6 kaf 3600.00 ft				Maximum Cont 1328.4 kaf Elev 3657.00 ft				Minimum Cont 493.6 kaf Elev 3547.00 ft				Total
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Boysen Release	kaf	24.6	44.6	67.6	69.9	76.9	69.2	59.5	57.1	55.2	57.1	57.1	23.0	661.8
Boysen Release	cfs	400	750	1099	1175	1251	1125	1000	929	928	929	929	414	
Buffalo Bill Riv Flo	kaf	9.2	58.9	108.7	125.9	123.8	77.5	75.0	24.9	20.8	21.5	21.5	8.6	676.3
Buffalo Bill Riv Flo	cfs	150	990	1768	2116	2013	1260	1260	405	350	350	350	155	
Station Gain	kaf	68.9	-13.4	-62.4	-61.6	-146.9	-111.6	-86.2	-7.8	4.3	-11.1	-9.5	33.5	-403.8
Monthly Inflow	kaf	102.7	90.1	113.9	134.2	53.8	35.1	48.3	74.2	80.3	67.5	69.1	65.1	934.3
Monthly Inflow	cfs	1670	1514	1852	2255	875	571	812	1207	1349	1098	1124	1172	
Turbine Release	kaf	87.9	85.7	99.0	95.1	115.6	114.7	103.9	92.0	85.1	87.9	87.9	79.4	1134.2
Bypass/Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Release	kaf	87.9	85.7	99.0	95.1	115.6	114.7	103.9	92.0	85.1	87.9	87.9	79.4	1134.2
Total Release	cfs	1430	1440	1610	1598	1880	1865	1746	1496	1430	1430	1430	1430	
Spring Flow	kaf	4.3	4.2	4.3	4.2	4.3	4.3	4.2	4.3	4.2	4.3	4.3	3.9	50.8
Irrigation Reqmnt	kaf	0.0	0.6	11.1	10.0	27.7	26.8	18.8	4.1	0.0	0.0	0.0	0.0	99.1
Afterbay Rels	kaf	92.2	89.9	103.3	99.3	119.9	119.0	108.1	96.3	89.3	92.2	92.2	83.3	1185.0
Afterbay Rels	cfs	1499	1511	1680	1669	1950	1935	1817	1566	1501	1499	1499	1500	
BIGHORN LAKE MONTHLY OPERATIONS	kaf	89.3	89.3	92.2	89.3	92.2	92.2	89.3	92.2	89.3	92.2	92.2	83.3	1085.9
River Release	cfs	1499	1501	1499	1501	1499	1499	1501	1499	1501	1499	1499	1500	
Min Release	kaf	92.2	89.3	92.2	89.3	92.2	92.2	89.3	92.2	89.3	92.2	92.2	83.3	1085.9
End-Month Targets	kaf				1070.0	1070.0								
End-Month Content	kaf	759.4	763.8	778.7	817.8	756.0	676.4	620.8	603.0	598.2	577.8	559.0	544.7	
End-Month Elevation	ft	3602.65	3603.42	3605.99	3612.25	3602.05	3587.02	3575.65	3571.87	3570.84	3566.39	3562.21	3558.97	
Net Change Content	kaf	14.8	4.4	14.9	39.1	-61.8	-79.6	-55.6	-17.8	-4.8	-20.4	-18.8	-14.3	-199.9
Yellowtail Power	2008	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Total
Turbine Release	kaf	87.9	85.7	99.0	95.1	115.6	114.7	103.9	92.0	85.1	87.9	87.9	79.4	1134.2
Generation	gwh	32.278	31.596	36.643	35.580	43.057	41.482	36.429	31.675	29.129	29.889	29.573	26.468	403.799
End-Month Power Cap	mw	252.4	253.1	255.4	261.1	251.9	237.6	225.4	221.1	219.8	214.4	209.1	204.8	
% Max Gen		15	15	17	17	20	19	18	15	14	14	14	14	
Ave kwh/af		367	369	370	374	372	362	351	344	342	340	336	333	356
Upstream Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Generation	gwh	32.278	31.596	36.643	35.580	43.057	41.482	36.429	31.675	29.129	29.889	29.573	26.468	403.799

Comments: A starting reservoir storage level was decreased to elevation 3600 and April-July inflows were 33% of average. River releases were reduced and maintained at 1,500 cfs all year. Reservoir storage peaked at elevation 3612.25 at the end of June and continued to drop through the remainder of the year to a critically low level at elevation 3559 by the end of February. This would only be 12 feet above the top of the inactive pool or the minimum reservoir level where the powerplant becomes inoperable.

BHXAOP V1.12 Run: 12-Feb-2008 13:32 (MFWP Option IV b.)  
 Based on Most Probable Inflow Forecast  
 April-July Inflow = 392.0 kaf (36% of 30-yr or 33% of P.O.R.)  
 Annual Inflow = 934.3 kaf (44% of 30-yr or 39% of P.O.R.)

Bighorn Reservoir		Initial Cont 836.7 kaf 3615.00 ft				Maximum Cont 1328.4 kaf Elev 3657.00 ft				Minimum Cont 493.6 kaf Elev 3547.00 ft				Total
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Boysen Release	kaf	24.6	44.6	67.6	69.9	76.9	69.2	59.5	57.1	55.2	57.1	57.1	23.0	661.8
Boysen Release	cfs	400	750	1099	1175	1251	1125	1000	929	928	929	929	414	
Buffalo Bill Riv Flo	kaf	9.2	58.9	108.7	125.9	123.8	77.5	75.0	24.9	20.8	21.5	21.5	8.6	676.3
Buffalo Bill Riv Flo	cfs	150	990	1768	2116	2013	1260	1260	405	350	350	350	155	
Station Gain	kaf	68.9	-13.4	-62.4	-61.6	-146.9	-111.6	-86.2	-7.8	4.3	-11.1	-9.5	33.5	-403.8
Monthly Inflow	kaf	102.7	90.1	113.9	134.2	53.8	35.1	48.3	74.2	80.3	67.5	69.1	65.1	934.3
Monthly Inflow	cfs	1670	1514	1852	2255	875	571	812	1207	1349	1098	1124	1172	
Turbine Release	kaf	87.9	85.7	99.0	95.1	115.6	114.7	103.9	92.0	85.1	87.9	87.9	79.4	1134.2
Bypass/Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Release	kaf	87.9	85.7	99.0	95.1	115.6	114.7	103.9	92.0	85.1	87.9	87.9	79.4	1134.2
Total Release	cfs	1430	1440	1610	1598	1880	1865	1746	1496	1430	1430	1430	1430	
Spring Flow	kaf	4.3	4.2	4.3	4.2	4.3	4.3	4.2	4.3	4.2	4.3	4.3	3.9	50.8
Irrigation Reqmnt	kaf	0.0	0.6	11.1	10.0	27.7	26.8	18.8	4.1	0.0	0.0	0.0	0.0	99.1
Afterbay Rels	kaf	92.2	89.9	103.3	99.3	119.9	119.0	108.1	96.3	89.3	92.2	92.2	83.3	1185.0
Afterbay Rels	cfs	1499	1511	1680	1669	1950	1935	1817	1566	1501	1499	1499	1500	
BIGHORN LAKE MONTHLY OPERATIONS	kaf	89.3	89.3	92.2	89.3	92.2	92.2	89.3	92.2	89.3	92.2	92.2	83.3	1085.9
River Release	cfs	1499	1501	1499	1501	1499	1499	1501	1499	1501	1499	1499	1500	
Min Release	kaf	92.2	89.3	92.2	89.3	92.2	92.2	89.3	92.2	89.3	92.2	92.2	83.3	1085.9
End-Month Targets	kaf				1070.0	1070.0								
End-Month Content	kaf	851.5	855.9	870.8	909.9	848.1	768.5	712.9	695.1	690.3	669.9	651.1	636.8	
End-Month Elevation	ft	3617.06	3617.66	3619.64	3624.50	3616.59	3604.24	3594.12	3590.70	3589.76	3585.72	3581.91	3578.98	
Net Change Content	kaf	14.8	4.4	14.9	39.1	-61.8	-79.6	-55.6	-17.8	-4.8	-20.4	-18.8	-14.3	-199.9
Yellowtail Power	2008	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Total
Turbine Release	kaf	87.9	85.7	99.0	95.1	115.6	114.7	103.9	92.0	85.1	87.9	87.9	79.4	1134.2
Generation	gwh	33.466	32.744	37.958	36.816	44.573	43.081	37.974	33.094	30.458	31.280	30.995	27.777	420.216
End-Month Power Cap	mw	265.5	266.0	267.9	272.4	265.1	253.8	244.5	241.2	240.3	236.3	232.3	229.1	
% Max Gen		16	16	18	18	21	20	18	15	15	15	14	14	
Ave kwh/af		381	382	383	387	386	376	365	360	358	356	353	350	370
Upstream Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Generation	gwh	33.466	32.744	37.958	36.816	44.573	43.081	37.974	33.094	30.458	31.280	30.995	27.777	420.216

Comments: A starting reservoir storage level was increased to elevation 3615 and April-July inflows were 33% of average. River releases were reduced and maintained at 1,500 cfs all year. Reservoir storage peaked at elevation 3624.50 at the end of June and continued to drop to a critically low level at elevation 3579 by the end of February. This would be about 32 feet above the top of the inactive pool at elevation 3547.

BHXAOP V1.12 Run: 12-Feb-2008 13:33 (MFWP Option IV c.)  
 Based on Most Probable Inflow Forecast  
 April-July Inflow = 392.0 kaf (36% of 30-yr or 33% of P.O.R.)  
 Annual Inflow = 934.3 kaf (44% of 30-yr or 39% of P.O.R.)

Bighorn Reservoir		Initial Cont 836.7 kaf 3615.00 ft				Maximum Cont 1328.4 kaf Elev 3657.00 ft				Minimum Cont 493.6 kaf Elev 3547.00 ft				Total
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Boysen Release	kaf	24.6	44.6	67.6	69.9	76.9	69.2	59.5	57.1	55.2	57.1	57.1	23.0	661.8
Boysen Release	cfs	400	750	1099	1175	1251	1125	1000	929	928	929	929	414	
Buffalo Bill Riv Flo	kaf	9.2	58.9	108.7	125.9	123.8	77.5	75.0	24.9	20.8	21.5	21.5	8.6	676.3
Buffalo Bill Riv Flo	cfs	150	990	1768	2116	2013	1260	1260	405	350	350	350	155	
Station Gain	kaf	68.9	-13.4	-62.4	-61.6	-146.9	-111.6	-86.2	-7.8	4.3	-11.1	-9.5	33.5	-403.8
Monthly Inflow	kaf	102.7	90.1	113.9	134.2	53.8	35.1	48.3	74.2	80.3	67.5	69.1	65.1	934.3
Monthly Inflow	cfs	1670	1514	1852	2255	875	571	812	1207	1349	1098	1124	1172	
Turbine Release	kaf	87.9	85.7	99.0	95.1	115.6	114.7	103.9	79.7	73.2	75.6	75.6	68.3	1074.3
Bypass/Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Release	kaf	87.9	85.7	99.0	95.1	115.6	114.7	103.9	79.7	73.2	75.6	75.6	68.3	1074.3
Total Release	cfs	1430	1440	1610	1598	1880	1865	1746	1296	1230	1230	1230	1230	
Spring Flow	kaf	4.3	4.2	4.3	4.2	4.3	4.3	4.2	4.3	4.2	4.3	4.3	3.9	50.8
Irrigation Reqmnt	kaf	0.0	0.6	11.1	10.0	27.7	26.8	18.8	4.1	0.0	0.0	0.0	0.0	99.1
Afterbay Rels	kaf	92.2	89.9	103.3	99.3	119.9	119.0	108.1	84.0	77.4	79.9	79.9	72.2	1125.1
Afterbay Rels	cfs	1499	1511	1680	1669	1950	1935	1817	1366	1301	1299	1299	1300	
BIGHORN LAKE MONTHLY OPERATIONS	kaf	89.3	89.3	92.2	89.3	92.2	92.2	89.3	79.9	77.4	79.9	79.9	72.2	1026.0
River Release	cfs	1499	1501	1499	1501	1499	1499	1501	1299	1301	1299	1299	1300	
Min Release	kaf	92.2	89.3	92.2	89.3	92.2	92.2	89.3	79.9	77.4	79.9	79.9	72.2	1026.0
End-Month Targets	kaf				1070.0	1070.0								
End-Month Content	kaf	851.5	855.9	870.8	909.9	848.1	768.5	712.9	707.4	714.5	706.4	699.9	696.7	
End-Month Elevation	ft	3617.06	3617.66	3619.64	3624.50	3616.59	3604.24	3594.12	3593.07	3594.42	3592.88	3591.63	3591.01	
Net Change Content	kaf	14.8	4.4	14.9	39.1	-61.8	-79.6	-55.6	-5.5	7.1	-8.1	-6.5	-3.2	-140.0
Yellowtail Power	2008	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Total
Turbine Release	kaf	87.9	85.7	99.0	95.1	115.6	114.7	103.9	79.7	73.2	75.6	75.6	68.3	1074.3
Generation	gwh	33.466	32.744	37.958	36.816	44.573	43.081	37.974	28.748	26.413	27.273	27.185	24.507	400.738
End-Month Power Cap	mw	265.5	266.0	267.9	272.4	265.1	253.8	244.5	243.5	244.8	243.3	242.1	241.5	
% Max Gen		16	16	18	18	21	20	18	13	13	13	13	13	
Ave kwh/af		381	382	383	387	386	376	365	361	361	361	360	359	373
Upstream Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Generation	gwh	33.466	32.744	37.958	36.816	44.573	43.081	37.974	28.748	26.413	27.273	27.185	24.507	400.738

Comments: A starting reservoir storage level was increased to elevation 3615 and April-July inflows were 33% of average. River releases were reduced and maintained at 1,500 cfs during March through September and then reduced to 1,300 cfs through the remainder of the year allowing storage to remain fairly stable between elevations 3591-3593 during October through February.

BHXAOP V1.12 Run: 12-Feb-2008 13:44 (MFWP Option V a.)  
 Based on Most Probable Inflow Forecast  
 April-July Inflow = 628.3 kaf (58% of 30-yr or 53% of P.O.R.)  
 Annual Inflow = 1588.5 kaf (74% of 30-yr or 67% of P.O.R.)

Bighorn Reservoir		Initial Cont 744.6 kaf 3600.00 ft				Maximum Cont 1328.4 kaf Elev 3657.00 ft				Minimum Cont 493.6 kaf Elev 3547.00 ft				Total
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Total
Boysen Release	kaf	24.6	44.6	67.6	69.9	76.9	69.2	59.5	57.1	55.2	57.1	57.1	23.0	661.8
Boysen Release	cfs	400	750	1099	1175	1251	1125	1000	929	928	929	929	414	
Buffalo Bill Riv Flo	kaf	9.2	58.9	108.7	125.9	123.8	77.5	75.0	24.9	20.8	21.5	21.5	8.6	676.3
Buffalo Bill Riv Flo	cfs	150	990	1768	2116	2013	1260	1260	405	350	350	350	155	
Station Gain	kaf	68.9	-19.8	10.2	27.6	-66.0	-36.0	7.8	69.0	42.8	20.9	44.7	80.3	250.4
Monthly Inflow	kaf	102.7	83.7	186.5	223.4	134.7	110.7	142.3	151.0	118.8	99.5	123.3	111.9	1588.5
Monthly Inflow	cfs	1670	1407	3033	3754	2191	1800	2391	2456	1997	1618	2005	2015	
Turbine Release	kaf	87.9	85.7	99.0	95.1	115.6	145.5	133.6	122.8	136.8	141.4	141.4	127.7	1432.5
Bypass/Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Release	kaf	87.9	85.7	99.0	95.1	115.6	145.5	133.6	122.8	136.8	141.4	141.4	127.7	1432.5
Total Release	cfs	1430	1440	1610	1598	1880	2366	2245	1997	2299	2300	2300	2299	
Spring Flow	kaf	4.3	4.2	4.3	4.2	4.3	4.3	4.2	4.3	4.2	4.3	4.3	3.9	50.8
Irrigation Reqmnt	kaf	0.0	0.6	11.1	10.0	27.7	26.8	18.8	4.1	0.0	0.0	0.0	0.0	99.1
Afterbay Rels	kaf	92.2	89.9	103.3	99.3	119.9	149.8	137.8	127.1	141.0	145.7	145.7	131.6	1483.3
Afterbay Rels	cfs	1499	1511	1680	1669	1950	2436	2316	2067	2370	2370	2370	2370	
BIGHORN LAKE MONTHLY OPERATIONS	kaf	89.3	89.3	92.2	89.3	92.2	123.0	119.0	123.0	141.0	145.7	145.7	131.6	1384.2
River Release	cfs	1499	1501	1499	1501	1499	2000	2000	2000	2370	2370	2370	2370	
Min Release	kaf	92.2	89.3	92.2	89.3	92.2	123.0	119.0	123.0	141.0	145.7	145.7	131.6	1384.2
End-Month Targets	kaf				1070.0	1070.0								
End-Month Content	kaf	759.4	757.4	844.9	973.2	992.3	957.5	966.2	994.4	976.4	934.5	916.4	900.6	
End-Month Elevation	ft	3602.65	3602.30	3616.15	3631.39	3633.25	3629.79	3630.68	3633.45	3631.71	3627.31	3625.26	3623.38	
Net Change Content	kaf	14.8	-2.0	87.5	128.3	19.1	-34.8	8.7	28.2	-18.0	-41.9	-18.1	-15.8	156.0
Yellowtail Power	2008	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Total
Turbine Release	kaf	87.9	85.7	99.0	95.1	115.6	145.5	133.6	122.8	136.8	141.4	141.4	127.7	1432.5
Generation	gwh	32.278	31.554	37.081	37.056	46.155	57.948	52.985	48.992	54.666	55.961	55.406	49.749	559.831
End-Month Power Cap	mw	252.4	252.1	264.7	279.0	280.8	277.4	278.3	281.0	279.3	275.1	273.1	271.4	
% Max Gen		15	15	17	18	22	27	26	23	26	26	26	26	
Ave kwh/af		367	368	375	390	399	398	397	399	400	396	392	390	391
Upstream Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Generation	gwh	32.278	31.554	37.081	37.056	46.155	57.948	52.985	48.992	54.666	55.961	55.406	49.749	559.831

Comments: A starting reservoir storage level was decreased to elevation 3600 and April-July inflows were 53% of average. River releases were reduced and maintained at 1,500 cfs during March through July and then increased and maintained at 2,000 cfs during August through October and later were able to be increased to over 2,300 cfs during November through February. However during November through February, the reservoir storage level would drop nearly 8.5 feet to an elevation of 3623.38 by the end of February.

BHXAOP V1.12 Run: 12-Feb-2008 13:48 (MFWP Option V b.)  
 Based on Most Probable Inflow Forecast  
 April-July Inflow = 628.3 kaf (58% of 30-yr or 53% of P.O.R.)  
 Annual Inflow = 1,588.5 kaf (74% of 30-yr or 67% of P.O.R.)

Bighorn Reservoir		Initial Cont 836.7 kaf 3615.00 ft				Maximum Cont 1328.4 kaf Elev 3657.00 ft				Minimum Cont 493.6 kaf Elev 3547.00 ft				Total
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Boysen Release	kaf	24.6	44.6	67.6	69.9	76.9	69.2	59.5	57.1	55.2	57.1	57.1	23.0	661.8
Boysen Release	cfs	400	750	1099	1175	1251	1125	1000	929	928	929	929	414	
Buffalo Bill Riv Flo	kaf	9.2	58.9	108.7	125.9	123.8	77.5	75.0	24.9	20.8	21.5	21.5	8.6	676.3
Buffalo Bill Riv Flo	cfs	150	990	1768	2116	2013	1260	1260	405	350	350	350	155	
Station Gain	kaf	68.9	-19.8	10.2	27.6	-66.0	-36.0	7.8	69.0	42.8	20.9	44.7	80.3	250.4
Monthly Inflow	kaf	102.7	83.7	186.5	223.4	134.7	110.7	142.3	151.0	118.8	99.5	123.3	111.9	1588.5
Monthly Inflow	cfs	1670	1407	3033	3754	2191	1800	2391	2456	1997	1618	2005	2015	
Turbine Release	kaf	87.9	85.7	99.0	95.1	130.0	145.5	133.6	122.8	152.8	158.0	158.0	142.6	1511.0
Bypass/Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Release	kaf	87.9	85.7	99.0	95.1	130.0	145.5	133.6	122.8	152.8	158.0	158.0	142.6	1511.0
Total Release	cfs	1430	1440	1610	1598	2114	2366	2245	1997	2568	2570	2570	2568	
Spring Flow	kaf	4.3	4.2	4.3	4.2	4.3	4.3	4.2	4.3	4.2	4.3	4.3	3.9	50.8
Irrigation Reqmnt	kaf	0.0	0.6	11.1	10.0	27.7	26.8	18.8	4.1	0.0	0.0	0.0	0.0	99.1
Afterbay Rels	kaf	92.2	89.9	103.3	99.3	134.3	149.8	137.8	127.1	157.0	162.3	162.3	146.5	1561.8
Afterbay Rels	cfs	1499	1511	1680	1669	2184	2436	2316	2067	2638	2640	2640	2638	
BIGHORN LAKE MONTHLY OPERATIONS	kaf	89.3	89.3	92.2	89.3	106.6	123.0	119.0	123.0	157.0	162.3	162.3	146.5	1462.7
River Release	cfs	1499	1501	1499	1501	1734	2000	2000	2000	2638	2640	2640	2638	
Min Release	kaf	92.2	89.3	92.2	89.3	92.2	123.0	119.0	123.0	141.0	145.7	145.7	131.6	1384.2
End-Month Targets	kaf				1070.0	1070.0								
End-Month Content	kaf	851.5	849.5	937.0	1065.3	1070.0	1035.2	1043.9	1072.1	1038.1	979.6	944.9	914.2	
End-Month Elevation	ft	3617.06	3616.78	3627.59	3639.62	3640.00	3637.13	3637.87	3640.16	3637.37	3632.03	3628.45	3625.00	
Net Change Content	kaf	14.8	-2.0	87.5	128.3	4.7	-34.8	8.7	28.2	-34.0	-58.5	-34.7	-30.7	77.5
Yellowtail Power	2008	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Total
Turbine Release	kaf	87.9	85.7	99.0	95.1	130.0	145.5	133.6	122.8	152.8	158.0	158.0	142.6	1511.0
Generation	gwh	33.466	32.705	38.365	38.191	53.267	59.354	54.287	50.174	62.378	63.603	62.670	55.953	604.413
End-Month Power Cap	mw	265.5	265.2	275.3	287.1	287.5	284.6	285.4	287.7	284.9	279.6	276.2	272.9	
% Max Gen		16	16	18	18	25	28	26	23	30	30	29	29	
Ave kwh/af		381	382	388	402	410	408	406	409	408	403	397	392	400
Upstream Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Generation	gwh	33.466	32.705	38.365	38.191	53.267	59.354	54.287	50.174	62.378	63.603	62.670	55.953	604.413

Comments: A starting reservoir storage level was increased to elevation 3615 and April-July inflows were 53% of average. River releases were reduced and maintained at 1,500 cfs during March through June and then increased to over 1,700 cfs during July to control storage and prevent the reservoir level from exceeding elevation 3640. With a full reservoir, the river releases were then increased and maintained at 2,000 cfs through October. This would then allow the reservoir storage level to increase and river were then increased to over 2,600 cfs and the storage level would drop to elevation 3625 by the end of February.



YOC, BOR MTA <sha-mta-yoc@usbr.gov>

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## Operating Criteria Comment

1 message

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Pam Felt <lovellaides@crcwyoming.org>

Fri, Jan 16, 2015 at 8:30 AM

To: sha-mta-yoc@usbr.gov

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From Pam Felt ([lovellaides@crcwyoming.org](mailto:lovellaides@crcwyoming.org)) on Friday, January 16, 2015 at 08:30:16

message: Please let us enjoy our lake! I love fishing there! Leave the levels as they are or even better give us a little more water! Thanks!

Winter minimum: 3620 feet

Memorial Day level: 3630

July to November level: 3640

address: 640 Oregon

city: Lovell, WY 82431

Submit: Send

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1/10/15 for the Bureau of Reclamation , Att: operating  
criteria

My comment: I believe the “rule curve” that you folks have  
used on Yellowtail has worked and you should continue this  
criteria.

The downstream fly fishermen should be happy that this dam  
has created the Blue Ribbon waters they enjoy. On the other hand,  
we in Wyoming need our water historic water levels behind the  
dam for many reasons. We are holding the silt, and down streamers  
should appreciate that fact. Do not succumb to downstream special  
interest groups, please.

Respectfully,

Randy Blackburn 84 South Fk. Rd.

Cody, Wyoming 82414



OFFICIAL FILE COPY		BUREAU OF RECLAMATION	
JAN 20 2015		MAIL ROOM	
FILE	NO REPLY NECESSARY	INITIAL	DATE
REPLY REQUIRED	ACTION TAKEN	CODE NO	DATE
INFO COPY TO	ROUTE TO	INITIALS	DATE
450		Jan	1/20/15
452			



Comment Form

Yellowtail Unit Operating Criteria  
Comment by January 16, 2015

(Please Print Clearly)

Name Randy Graham

Organization and Address Self  
P.O. Box 253  
Loveell, WY 82431

Phone (307) 548-7566 FAX ( ) \_\_\_\_\_ E-mail rlgraham@tetwest.net

**Narrative Comments:**

With the continuing siltation problem in the lake, recreational use is slowly being diminished. Two possible options to address this problem, particularly at Horseshoe Bend boat ramp and above the Kane causeway, is either removal of silt by dredging or similar means, or raising the joint use space to an elevation of 3645, or 5 feet above the current level of 3640. This would allow maintenance of a minimum lake level of 3620, which is necessary for launching boats at Horseshoe Bend. An elevation in the joint use space would also be beneficial for annual migratory waterfowl during fall migrations as well as additional spawning areas for the varied species of game fish in the lake.

-Attach additional sheets if necessary-

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

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YOC, BOR MTA <sha-mta-yoc@usbr.gov>

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## Operating Criteria Comment

1 message

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**Rhonda Christensen** <rchristensen50@gmail.com>  
To: sha-mta-yoc@usbr.gov

Thu, Jan 15, 2015 at 4:47 PM

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From Rhonda Christensen ([rchristensen50@gmail.com](mailto:rchristensen50@gmail.com)) on Thursday, January 15, 2015 at 16:47:19

message: We love Horse Shoe Bend and spend many days in the summer there - swimming, boating, fishing. When the dam was first built many families were displaced - over 70 - in order to have recreation and tourism. Without water that will not happen. No one benefits from an empty lake. Please keep water in the lake. People in the community need this area and need the revenue it brings in.

address: 1396 Road 11

city: LOVELL, WY 82431

Submit: Send

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YOC, BOR MTA <sha-mta-yoc@usbr.gov>

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## Operating Criteria Comment

1 message

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**Rick Woodford** <rwoodford@me.com>

Thu, Jan 15, 2015 at 3:35 PM

To: sha-mta-yoc@usbr.gov

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From Rick Woodford ([rwoodford@me.com](mailto:rwoodford@me.com)) on Thursday, January 15, 2015 at 15:35:20

message: The Bighorn Lake is a key recreational attraction for Big Horn County and the Town of Lovell. Boating, during the months of May-September, brings visitors through our town and really helps the local economy that would otherwise be depressed. Furthermore, the recreation that is available provides the local community with something to look forward to. When we boat, we are able to relax and enjoy the outdoors with family, neighbors and friends. The lake is a vital part of our community. Please manage the water-levels of the lake so that boats can be launched near our town during these vital months. Thank you.

address: 29 E. 10th Street

city: Lovell, WY 82431

Submit: [Send](#)

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YOC, BOR MTA <sha-mta-yoc@usbr.gov>

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## Operating Criteria Comment

1 message

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nobody <nobody>

Mon, Dec 8, 2014 at 1:20 PM

To: sha-mta-yoc@usbr.gov

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From Robert Hawley () on Monday, December 08, 2014 at 13:20:51

message: Because Lovell, WY, is the gateway to Big Horn Lake boating and fishing, it is important to maintain the lake level at 3,620 ft. by Memorial Day, and 3,640 ft. by July in order for recreation to take place. Additionally, a lake level of 3,635 to 3,640 ft. through the end of Nov. is necessary to support the National Waterfowl Flyway.

The "rule curve" method works the best as a compromise for those on either end of the Yellowtail Reservoir. Both ends share a little pain, but both get reasonable benefits.

Loss of boating and fishing on the lake will have an adverse effect on our local economy. Many recreationists stop in Lovell to get gas, food, ice, fishing gear, camping gear, etc. We need that additional income in our little community from Spring to Fall. It matters!

address: 7 Circle Drive

city: Lovell, WY 82431

Submit: Send

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**Comment Form**

**Yellowtail Unit Operating Criteria  
Comment by January 16, 2015**

**(Please Print Clearly)**

**Name** Scotty Leonhardt

**Organization and Address** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

**Phone** (307) 272 2149 **FAX** ( ) \_\_\_\_\_ **E-mail** leonhardt86@gmail.com

**Narrative Comments:**

would like to see the water levels at the  
lake stay the way they are now.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
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\_\_\_\_\_  
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**-Attach additional sheets if necessary-**

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Comment Form

**Yellowtail Unit Operating Criteria  
Comment by January 16, 2015**

(Please Print Clearly)

Name Shane Pitt

Organization and Address 242 Montana Ave Lovell, WY 82431

Phone (307) 272-6763 FAX ( ) \_\_\_\_\_ E-mail \_\_\_\_\_

**Narrative Comments:**

leave water at the levels they are now!

**-Attach additional sheets if necessary-**

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Comment Form

Yellowtail Unit Operating Criteria  
Comment by January 16, 2015

(Please Print Clearly)

Name Steven Keil

Organization and Address FOBHL

1039 Ln 12

Lovell wy 82431

Phone (307) 548-7785 FAX ( ) \_\_\_\_\_ E-mail SKeil@tetwest.net

Narrative Comments:

I would like to see a winter draw down to 3617 then fill lake in Spring to 3640 by June 7, in this way, we can maximize recreation and fishing potential on the south end of lake. I would also like to see some high level leadership on the sedimentation issue - this needs attention soon or the lake will vanish, to the detriment of all users. I would also like the Corps of Engineers to give us another \$4M in the Flood pool to bring us to 3645 at full pool.

-Attach additional sheets if necessary-

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## Operating Criteria Comment

1 message

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**Tashie Lundberg** <tlundberg@crcwyoming.org>  
To: sha-mta-yoc@usbr.gov

Fri, Jan 16, 2015 at 8:33 AM

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From Tashie Lundberg ([tlundberg@crcwyoming.org](mailto:tlundberg@crcwyoming.org)) on Friday, January 16, 2015 at 08:33:11

message: We love Big Horn Lake! We do activities out there all year long. We need the levels of the lake to be consistent to support our community. During the winter my family enjoys ice fishing and ice skating. In the summer we take friends and family out on our boat regularly. We enjoy the family time we share together doing an activity we love.

The water levels need to stay at 3620 in the winter, and 3630 at memorial day, as well at a consistent level of 3640 from July to November. If this doesn't occur our lake will be not as usable and we will not be able to share the beauty and love of nature that we having been appreciating for years. We also need to address the silt issue because we are losing area each year. I am not sure if this is where we address the log issue either, but if anything can be done with the logs that would be great! We need to all work together to help all the communities, this lake supports several of the surrounding communities and supports our local economy for 100s of miles around. Please consider this comment and those shared regarding our lake! Thank you!!

address: 15 Benchview Est

city: Lovell

Submit: Send

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## Operating Criteria Comment

1 message

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Tim Winland <Twinland@bighorn1.com>

Sat, Nov 29, 2014 at 8:46 AM

To: sha-mta-yoc@usbr.gov

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From Tim Winland ([Twinland@bighorn1.com](mailto:Twinland@bighorn1.com)) on Saturday, November 29, 2014 at 08:46:24

message: To whom it may concern:

I am writing in support of maintaining required lake levels to meet Wyoming's recreational and fishing requirements. Which means a minimum of 3620 elevation or higher by Memorial Day weekend, 3640 by July for summer recreation, and maintaining 3640 to 3635 through the end of November to support the national water fowl flyway and to sustain the lake fishery, especially the pure strain sensitive species Sauger, not to mention ice fishing during the winter.

It's my understanding that the NPS and BOR have an MOU, that currently provides for optimum and minimum levels desirable for public recreation use within the bighorn canyon recreation area. This agreement is a compromise between the north and south end recreationist. Might I remind everyone that the legislative boundary of the Yellowtail project and Bighorn Canyon NRA do not include the Bighorn River below the Afterbay Dam.

Although not perfect, the current MOU allows for both ends to enjoy the great outdoors, where as before the south end users were often left without enough water to even see a reservoir, let alone enough water to launch a boat. For many years the lake was left dry to accommodate trout fishing below the Afterbay Dam, which was never the original intent of building the dam.

Since the MOU was put in place, the Bighorn Canyon Recreation Area has become what it was intended to be. Outdoor enthusiast from Montana and Wyoming have been enjoying boating, skiing, fishing, hunting, camping, celebrations and provided a boost to our local economy. I strongly urge the powers that be to continue the current operating plan and MOU that has proven to support the needs of both ends of the lake.

Sincerely  
Tim Winland

address: 1205 road 11

city: Lovell, wyoming 82431

Submit: Send

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Comment Form

Yellowtail Unit Operating Criteria  
Comment by January 16, 2015

(Please Print Clearly)

Name Tyler Angell

Organization and Address 618 Oregon Ave  
Levell WY 82431

Phone (307) 272-2280 FAX ( ) \_\_\_\_\_ E-mail tywsm270@gmail.com

Narrative Comments:

Would like to see water levels the way they  
are. Need to stick to the plan that is in place,  
we worked hard to get this far it should not  
be changed now. Disappointing to see hard work go so  
far, and then folks try to change it. With both  
ends of the lake benefiting, why change it now.

-Attach additional sheets if necessary-

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These are some ideas on how to comment on the 2015 management of Bighorn Canyon NRA lake management.

We would again like to ask the U.S. Army Corps of Engineers (Corps) raise the top of the joint use space from 3640 feet to 3645 feet. This would reduce the exclusive flood pool allocation by five feet.

Bighorn Lake Sediment is an issue that must be fixed by BOR and NPS as operators of the reservoir. We envision multiple partners would join this project. As the silt builds the water storage in the reservoir shrinks, this impacts everyone, lake recreation, fishing, stream flows, power generation, flood control!

Required Lake levels to meet Wyoming's recreation and fishing requirements

Memorial day lake level needs to be at 3620 elevation or higher

lake levels for summer recreation need to reach 3640 by July

lake levels of 3640 to 3635 through the end of November to support the national water fowl flyway

Wyoming Game and fish requirement mirror these lake levels to sustain the lake fishery, especially the pure strain sensitive species Sauger.

The National Park service recommends 3640 between Memorial day and Labor day, with a minimum of 3630. For non-summer season NPS recommends a minimum lake level of 3620.

The economy of the local business benefit from these lake levels without water in Wyoming the Lovell area suffers

The NPS and BOR have an MOU, which states "The service shall determine optimum and minimum pool levels desirable for public recreational use and provide the Bureau with this information for consideration in carrying out the purposes of this chapter.

#### **SUBCHAPTER LXXVIII—BIGHORN CANYON NATIONAL RECREATION AREA**

### **§460t. Establishment**

#### **(a) In general; description of area**

In order to provide for public outdoor recreation use and enjoyment of the proposed Yellowtail Reservoir and lands adjacent thereto in the States of Wyoming and Montana by

the people of the United States and for preservation of the scenic, scientific, and historic features contributing to public enjoyment of such lands and waters, there is hereby established the Bighorn Canyon National Recreation Area

An absolute minimum lake level of 3617 is required

This is a link to the comments page

[http://www.usbr.gov/gp/mtao/yellowtail/operating\\_criteria.html](http://www.usbr.gov/gp/mtao/yellowtail/operating_criteria.html)

The legislative Boundary of the Yellowtail project and the Bighorn Canyon NRA do not include the Bighorn River below the Afterbay Dam.



Comment Form

Yellowtail Unit Operating Criteria  
Comment by January 16, 2015

(Please Print Clearly)

Name Tyler Stahl

Organization and Address \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone (307) 272-4002 FAX ( ) \_\_\_\_\_ E-mail Tyler.Stahl@Halliburton.com

Narrative Comments:

I would like to see the lake ~~operated~~ plan stay how it is so that it is beneficial to everyone. It is very nice to be able to go ice fishing & boating on the lake.

-Attach additional sheets if necessary-

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JAN 13 2015

Comment Form

Yellowtail Unit Operating Criteria  
Comment by January 16, 2015

(Please Print Clearly)

Name Wayne Spragg

Organization and Address 252 Oregon Ave

Lovell, Wyoming 82431

Phone (307) 250-2099 FAX ( ) \_\_\_\_\_ E-mail \_\_\_\_\_

Narrative Comments:

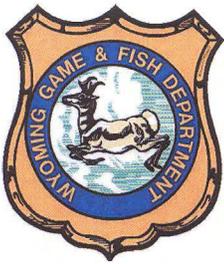
If I understand correctly the fisherman below the afterbay are not happy with the water levels and flows. They need to be reminded that the blue ribbon fishery they enjoy was a direct benefit of yellowtail Dam. Also remind them the people who were displaced on the upper and suffered the most. Remind them also they "are not" included in the master plan. Hopefully mother nature will provide us with enough water to keep all happy. Let BOR and Army Corps. run the lake and dam as it was intended to be.

Thanks  
Wayne

-Attach additional sheets if necessary-

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

Additional information can be found on the Bighorn River Issues Group website at [http://www.usbr.gov/gp/mtao/yellowtail/operating\\_criteria.html](http://www.usbr.gov/gp/mtao/yellowtail/operating_criteria.html) Please mail comments to: Bureau of Reclamation, Montana Area Office, ATTN: YT Unit Operating Criteria, P.O. Box 30137, Billings, MT 59107. Thank you.



# WYOMING GAME AND FISH DEPARTMENT

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December 10, 2014

Brent Esplin  
Area Manager  
Bureau of Reclamation  
Montana Area Office  
P.O. Box 30137  
Billings, MT 59107

Dear Mr. Esplin:

Thank you for the opportunity to comment on the Bureau of Reclamations Operating Criteria for Yellowtail Dam. The Wyoming Game and Fish Department understands the complexities behind water management in this system and we appreciate the effort that the Bureau has devoted towards resolving the concerns of all stakeholders. After reexamination, we remain convinced that the existing (2012) operating criteria utilized well, the best available information in a manner that successfully balanced consumptive uses of water with the needs of the river and reservoir fisheries, and have done so while simultaneously minimizing the percentage of time that river flows and/or reservoir elevations are below recommended levels.

Because of the success demonstrated these last five years, we strongly encourage the Bureau to continue to operate Yellowtail Dam within the bounds defined by the existing operating criteria. Additionally, we hope that continuation of open dialogue in the form of the biannual Issues Group meetings and the bimonthly conference calls will keep all stakeholders informed and engaged regarding water management within the Bighorn system. It was with transparency and inclusivity that the Bureau successfully met so many seemingly competing interests with the current operating criteria. Consequently, the river and reservoir fisheries are robust and have thrived through both poor and great water years; a testament to both the public process and the resulting criteria.

Should the Bureau consider management decisions that are outside of the existing operating criteria, we expect that all stakeholders will be invited back to participate as a group and not singularly. It was after all, a public crucible of contention and ultimately cooperation that so successfully forged the current criteria.

Sincerely,

Mark Fowden  
Chief of Fisheries

MF/ca/sh

Enclosure

cc: File

<b>OFFICIAL FILE COPY</b>		
<b>BOR - MTAO</b>		
<b>DEC 23 2014</b>		
DATE RECEIVED		
FILE:		
NO REPLY NECESSARY	INITIAL	DATE
REPLY OR OTHER ACTION TAKEN	CODE NO.	DATE
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100	JBS	12/24
105	TG	12/24
700		
400		
452		
450	Jim	12/30



YOC, BOR MTA <sha-mta-yoc@usbr.gov>

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## Fwd: Big Horn Lake Operating Criteria Comments

1 message

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Jordan, Clayton <cjordan@usbr.gov>  
To: sha-mta-yoc@usbr.gov

Wed, Jan 7, 2015 at 1:50 PM

----- Forwarded message -----

From: Absaraka <Absaraka@bhwi.net>

Date: Wed, Jan 7, 2015 at 1:40 PM

Subject: Big Horn Lake Operating Criteria Comments

To: besplin@usbr.gov, sdavies@usbr.gov, tfelichie@usbr.gov, "Jordan, Clayton" <cjordan@usbr.gov>

Here are my comments recapping the 2014 operating criteria and suggestions for the 2015 operating criteria for Big Horn Lake. Please let me know if there are any areas that need clarification. As always, I appreciate your continues efforts to manage the Big Horn Lake and River in a manner that is equitable for all stakeholders.

Cordially,

Zoe Opie

Big Horn River Alliance

406-666-2304



**Bureau of Reclamation Criteria Letter.docx**

15K

Bureau of Reclamation  
Montana Area Office  
YT Unit Operating Criteria  
P.O. Box 30137  
Billings, MT. 59107  
January 5, 2015

I am writing to you in response to your request for comments on the good and areas for improvement for the operating criteria currently being used at the Yellowtail Dam.

There are many positive things that have been happening since the operating criteria was adopted in spring of 2012. 2014 was a record setting year for water in the Big Horn and Yellowtail basins. I appreciate the effort by your group as a whole to communicate what needed to be done to release this water, as well as your request for input from me and The Big Horn River Alliance.

The negative issues were discussed at the Fall River issues meeting. I would like to reiterate those here and see if the criteria, which has a good base, can be adjusted to accommodate all stakeholders.

The number one issue with the current criteria and its application is the constant river flow adjustments. We were all aware of the need for the higher flows in the spring of 2014. It is unfathomable that those 8500 CFS needed to be dropped to 2500 CFS in late May and early June. This occurred during the height of the rainbow spawn, in essence killing this year's spawn. There was still record snow pack in the mountains, but despite knowing this, the water was lowered in order to start filling the lake so Lovell could launch their boats by July 4<sup>th</sup>. I am not unsympathetic to the plight of Lovell, but perhaps a lower CFS release, for a longer period would have solved the problems.

The 2500 CFS was followed by an emergency phone conference to tell us that, guess what, it was going to be over 90 degrees the weekend of July 4<sup>th</sup>, and all of that snow was going to start melting. Up goes the river to 7500 CFS.

The river was eventually once again lowered to 2500 CFS, only to have constant 250-1000CFS adjustment made throughout the rest of the summer and fall

season. Every time an adjustment is made to the flow to the river, no matter how minor, it results in the water turning muddy and fishing is terrible. Imagine that you saved your money all year and booked a trip to the legendary Big Horn River for a fishing trip, only to find that the water flow was unnecessarily being adjusted two to three times a week.

This leads me to a proposal to adjust the “full pool” number for the operating criteria to 3630 Feet from the current 3640. By applying the rule curve to the 3630 three things can be accomplished.

- There is some breathing room between full pool and the flood pool, thus eliminating the knee jerk reactions to water releases every time there is a water event or temperature fluctuation.
- Less time in the flood pool, means less time spent in conference with The Corp of Engineers
- Lovell may be able to hold on to more water longer and thus improve their launch rate in the spring.

In addition I would like to emphasize that 2500 CFS is not an optimum flow. Optimum flow is 3500- 4000 CFS. Surely in a year that we had too much water, it could be figured out how to maintain an optimum flow.

The one thing I heard repeatedly last year was that Wyoming was not releasing any water from Buffalo Bill and Boysen Reservoirs. It was obvious that Wyoming had the same snow pack as Montana. It would seem that a leap of faith could have been made and figure the gains from these reservoirs would eventually come into the Yellowtail. 8500 CFS could have been lower if water had been released earlier.

I appreciate your efforts in the past. Although the criteria is not perfect, it is substantially better than in the past. The communications from everyone associated with the BOR has been outstanding.

Zoe Opie  
President  
Big Horn River Alliance